SONY

3-081-414-**11**(1)

Digital Video Camera Recorder

Mini DV Digital Video Cassette

Operating Instructions

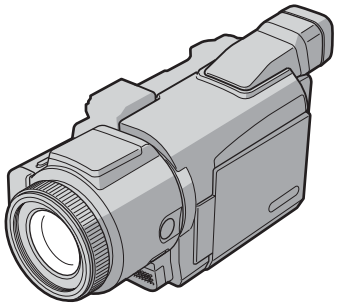
Before operating the unit, please read this manual thoroughly, and retain it for future reference.

Owner's Record

The model and serial numbers are located on the bottom. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. **DCR-TRV** _____ Model No. **AC-** _____

Serial No. _____ Serial No. _____



DCR-TRV70

Digital Handycam

Network Handycam

InfoLITHIUM M SERIES

Cassette Memory

MEMORY STICK ™

DCR-TRV60/TRV70

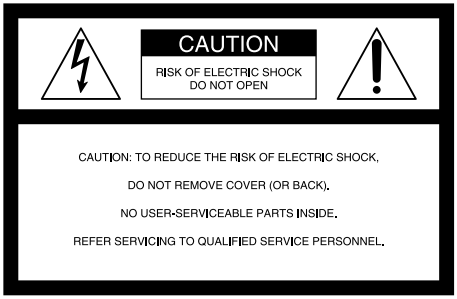
©2003 Sony Corporation

Welcome!

Congratulations on your purchase of this Sony Handycam. With your Handycam, you can capture life's precious moments with superior picture and sound quality. Your Handycam is loaded with advanced features, but at the same time it is very easy to use. You will soon be producing home video that you can enjoy for years to come.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.





This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

CAUTION

The use of optical instruments with this product will increase eye hazard. As the laser beam used in this Handycam is harmful to eyes, do not attempt to disassemble the cabinet.
Refer servicing to qualified personnel only.

Notice

If static electricity or electromagnetism causes data transfer to discontinue midway (fail), restart the application or disconnect and connect the USB cable again.

For customers in the U.S.A. and CANADA

CAUTION

TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

RECYCLING LITHIUM-ION BATTERIES

Lithium-Ion batteries are recyclable.
You can help preserve our environment by returning your used rechargeable batteries to the collection and recycling location nearest you.



For more information regarding recycling of rechargeable batteries, call toll free 1-800-822-8837, or visit http://www.rbrc.org/

Caution: Do not handle damaged or leaking Lithium-Ion batteries.

"Memory Stick"

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This Class B digital apparatus complies with Canadian ICES-003.

For customers in the U.S.A.

If you have any questions about this product, you may call:
Sony Customer Information Center 1-800-222-SONY (7669)
The number below is for the FCC related matters only.

Regulatory Information

Declaration of Conformity

Trade Name:	SONY
Model No.:	DCR-TRV70
Responsible Party:	Sony Electronics Inc.
Address:	680 Kinderkamack Road, Oradell, NJ07649 U.S.A.
Telephone No.:	201-930-6972

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2)this device must accept any interference received, including interference that may cause undesired operation.

CAUTION

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

— Reorient or relocate the receiving antenna.
— Increase the separation between the equipment and receiver.
— Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
— Consult the dealer or an experienced radio/TV technician for help.

The supplied interface cable must be used with the equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

Main Features

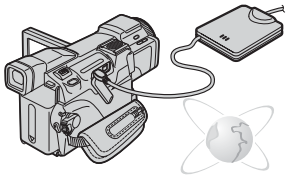


- Recording moving pictures on a tape (p. 25)
- Playing back a tape (p. 39)
- Recording still images on a “Memory Stick” (p. 46, 109)
- Recording moving pictures on a “Memory Stick” (p. 122)
- Viewing still images recorded on the “Memory Stick” (p.130)
- Viewing moving pictures recorded on the “Memory Stick” (p. 132)

- Viewing moving pictures recorded on the tape using the USB cable (p. 156)
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- Capturing images on the computer from your camcorder using the USB cable (p. 158)
- Converting an analog signal to digital to capture images onto the computer (p. 169)



Accessing the Internet via a USB device (optional) that supports your camcorder (DCR-TRV70 only)



Accessing the Internet, sending/receiving your e-mail. For details, refer to the Network Function/Application Operating Instructions supplied with your camcorder. (DCR-TRV70 only) (p. 171)

Other uses

Functions for adjusting exposure during recording

- Back light (p. 34)
- NightShot/Super NightShot/Color Slow Shutter (p. 34)
- PROGRAM AE (p. 59)
- Manual exposure (p. 61)
- Flexible Spot Meter (p. 62)
- Recording images with the flash (p. 113)

Functions for giving images more impact

- Digital zoom (p. 33)
 The default setting is **OFF**. (To zoom greater than 10×, select the digital zoom power in **D ZOOM** in the menu settings.)
- Fader (p. 52)
- Picture effect (p. 55)
- Digital effect (p. 56)
- Title (p. 97)
- MEMORY MIX (p. 118)

Functions for giving a natural appearance to your recordings

- PROGRAM AE (p. 59)
 – SPORTS
 – LANDSCAPE
- Manual focus (p. 63)
- Expanded focus (p. 63)
- Spot Focus (p. 65)

Functions for using after recording

- End search/Edit search/Rec Review (p. 37)
- Data code (p. 40)
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Quick Start Guide – Recording on a tape

1 Connecting the power cord

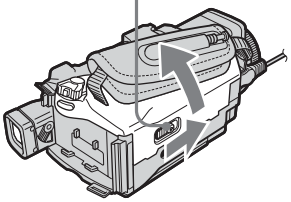
Use the battery pack when using your camcorder outdoors (p. 15).

2 Inserting a cassette

❶ Slide OPEN / ⏏ EJECT in the direction of the arrow to open the lid.

❷ Push the center of the cassette back to insert the cassette. Insert the cassette into the cassette compartment with the window facing up.

❸ Close the cassette compartment by pressing PUSH on the cassette compartment. After the cassette compartment goes down completely, close the lid until it clicks.



To eject the cassette

Follow the procedure above, and take out the cassette after the cassette compartment opens completely in Step 2.

Note

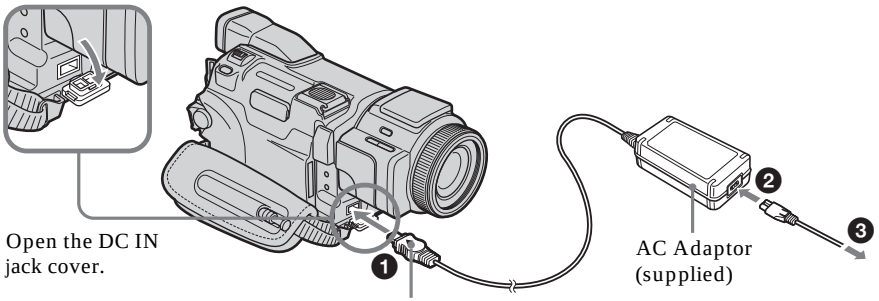
Do not press the cassette compartment down forcibly. Doing so may cause a malfunction.



Quick Start Guide – Recording on a "Memory Stick"

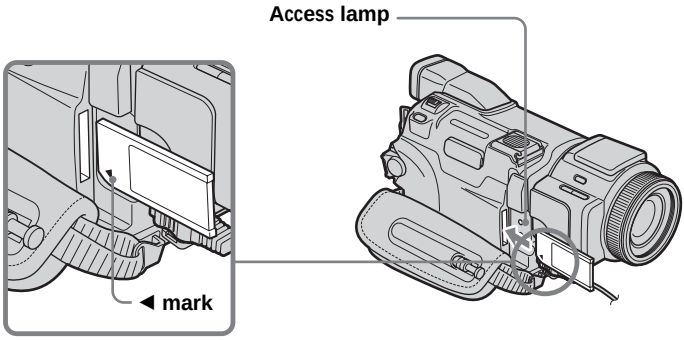
1 Connecting the power cord

Use the battery pack when using your camcorder outdoors (p. 15).



2 Inserting a "Memory Stick" (p. 104)

Insert a "Memory Stick" in the "Memory Stick" slot as far as it can go with the ◄ mark facing out as illustrated.



Press the "Memory Stick" once lightly to eject it.

While the access lamp is lit or flashing

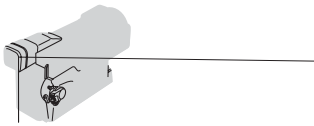
Do not shake or knock your camcorder because your camcorder is reading the data from the "Memory Stick" or recording the data on the "Memory Stick." Do not turn the power off, eject the "Memory Stick" or remove the battery pack. Otherwise, image data may become damaged.

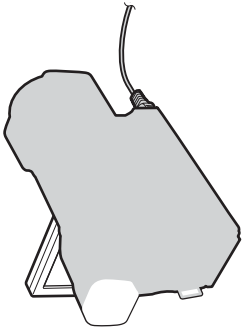
How to hold your camcorder

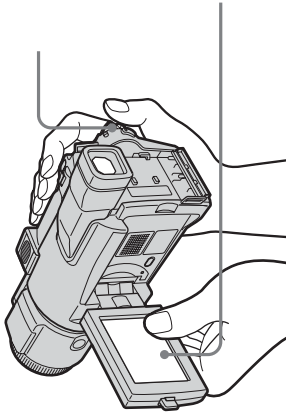


Fastening the grip belt

Fasten the grip belt firmly.





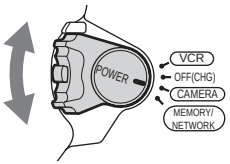


Using this manual

The instructions in this manual are for the two models listed in the table below. Before you start reading this manual and operating your camcorder, check the model number by looking at the bottom of your camcorder. The DCR-TRV70 is the model used for illustration purposes. Otherwise, the model name is indicated in the illustrations. Any differences in operation are clearly indicated in the text, for example, “DCR-TRV70 only.”

As you read through this manual, buttons and settings on your camcorder are shown in capital letters.

After “Advanced Recording Operations” section of this manual, position of the POWER switch is shown by the icons below.



VCR : Set the POWER switch to VCR.
CAMERA : Set the POWER switch to CAMERA.
MEMORY : Set the POWER switch to MEMORY / NETWORK (DCR-TRV70 only).

DCR-TRV70 only
The MEMORY / NETWORK position of the POWER switch is shown as MEMORY or MEMORY in this manual.

When you carry out an operation, you can hear a beep to indicate that the operation is being carried out.

Types of differences

DCR-	TRV60	TRV70
Mark on the POWER switch	MEMORY	MEMORY / NETWORK
Network function	—	●

● Provided
— Not provided

Note on Cassette Memory

Your camcorder is based on the DV format. You can use only mini DV cassettes on your camcorder. We recommend that you use a cassette with Cassette Memory .

Cassettes with Cassette Memory have the (Cassette Memory) mark.

Note on TV color systems

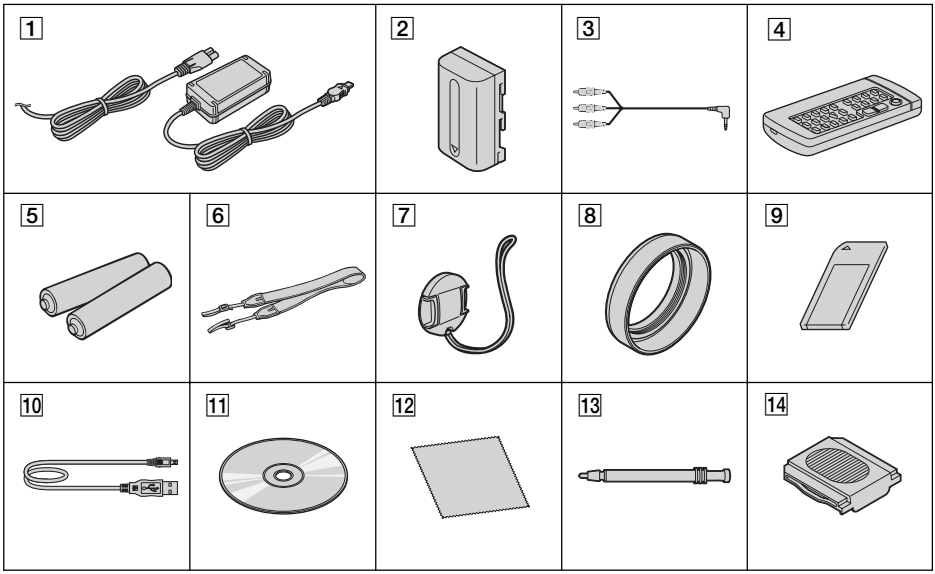
TV color systems differ depending on the country or area. To view your recordings on a TV, you need an NTSC system-based TV.

Copyright precautions

Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the copyright laws.

Checking supplied accessories

Make sure that the following accessories are supplied with your camcorder.



1 **AC-L15A/L15B AC Adaptor** (1), **power cord** (1) (p. 16)

2 **NP-FM50 rechargeable battery pack** (1) (p. 15, 16)

3 **A/V connecting cable** (1) (p. 44)

4 **Wireless Remote Commander** (1) (p. 215)

5 **Size AA (R6) battery for Remote Commander** (2) (p. 216)

6 **Shoulder strap** (1)

7 **Lens cap** (1) (p. 25)

8 **Lens hood** (1) (p. 32)

9 **"Memory Stick"** (1) (p. 102)

10 **USB cable** (1) (p. 143)

11 **CD-ROM (SPVD-010 USB Driver)** (1) (p. 148)

12 **Cleaning cloth** (1) (p. 203)

13 **Stylus** (1) (DCR-TRV70 only) (p. 171)

14 **Shoe cover** (1) (p. 94)

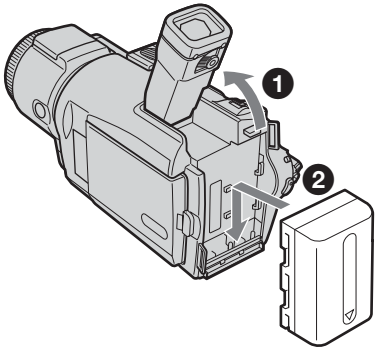
Contents of the recording cannot be compensated if recording or playback is not made due to a malfunction of the camcorder, storage media, etc.

Step 1 Preparing the power source

Installing or removing the battery pack

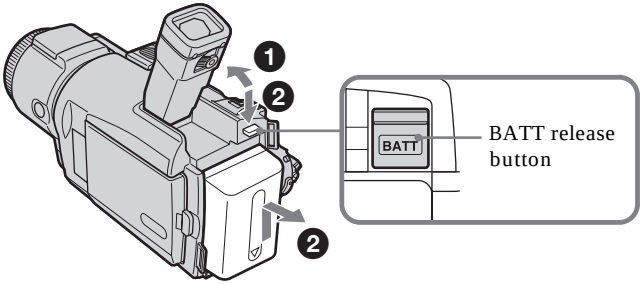
Be sure to set the POWER switch to OFF (CHG) before installing, removing or exchanging the battery pack.

(1) Lift up the viewfinder.
(2) Slide the battery pack down until it clicks.



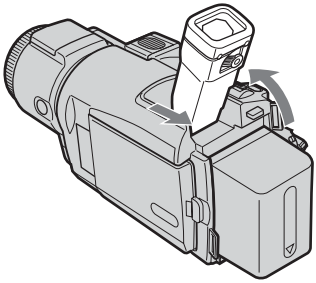
To remove the battery pack

(1) Lift up the viewfinder.
(2) Slide the battery pack out in the direction of the arrow while pressing BATT down.



If you use the large capacity battery pack

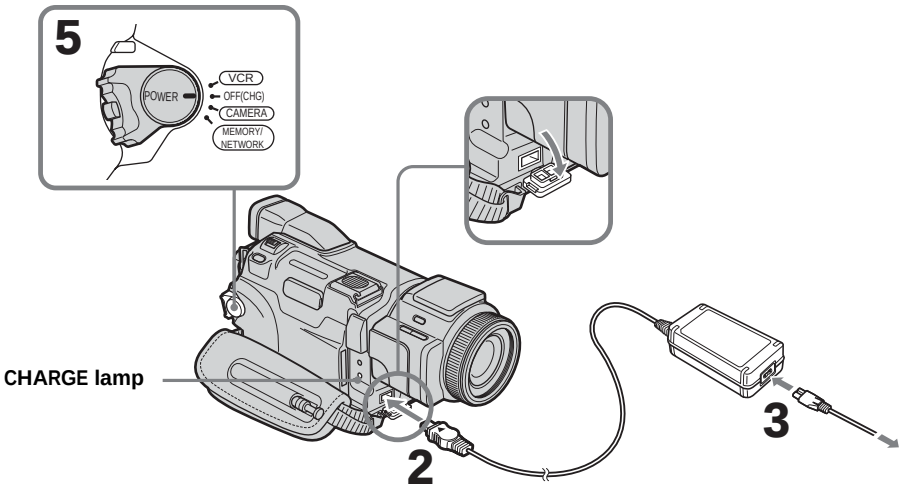
If you install the NP-FM70/QM71/QM71D/FM91/QM91/QM91D battery pack on your camcorder, extend and lift up the viewfinder and adjust the angle of it.



Charging the battery pack

Use the battery pack after charging it for your camcorder.
Your camcorder operates only with the **"InfoLITHIUM" battery pack (M series)**.
See page 197 for details on "InfoLITHIUM" battery pack.

(1) Install the battery pack on your camcorder.
(2) Connect the AC Adaptor supplied with your camcorder to the DC IN jack with the DC plug's ▲ mark facing up.
(3) Connect the power cord to the AC Adaptor.
(4) Connect the power cord to a wall outlet.
(5) Set the POWER switch to OFF (CHG). Charging begins. The CHARGE lamp lights up. When charging is completed, the CHARGE lamp turns off **(full charge)**.



After charging the battery pack

Disconnect the AC Adaptor from the DC IN jack on your camcorder.

Note

Prevent metallic objects from coming into contact with the metal parts of the DC plug of the AC Adaptor. This may cause a short-circuit, damaging the AC Adaptor.

When you use the AC Adaptor

Place the AC Adaptor near a wall outlet. While using the AC Adaptor, if any trouble occurs with this unit, disconnect the plug from a wall outlet as soon as possible to cut off the power.

Note on the CHARGE lamp

The CHARGE lamp flashes in the following cases:
– The battery pack is not properly installed.
– Something is wrong with the battery pack.

Charging time

Battery pack	Full charge
NP-FM50 (supplied)	150
NP-FM70	240
NP-QM71/QM71D	260
NP-FM91/QM91/QM91D	360

Approximate minutes at 25°C (77°F) to charge an empty battery pack
The charging time may increase if the battery's temperature is extremely high or low because of the ambient temperature.

Recording time

Battery pack	Recording with the viewfinder		Recording with the LCD screen	
	Continuous	Typical*	Continuous	Typical*
NP-FM50 (supplied)	125	70	105	60
NP-FM70	265	155	220	130
NP-QM71/QM71D	305	180	255	150
NP-FM91/QM91/QM91D	465	270	390	230

Approximate minutes when you use a fully charged battery pack

* Approximate number of minutes when recording while you repeat recording start/stop, zooming and turning the power on/off. The actual battery life may be shorter.

Playing time

Battery pack	Playing time with the LCD panel closed	Playing time on the LCD screen
NP-FM50 (supplied)	220	160
NP-FM70	450	335
NP-QM71/QM71D	530	390
NP-FM91/QM91/QM91D	785	585

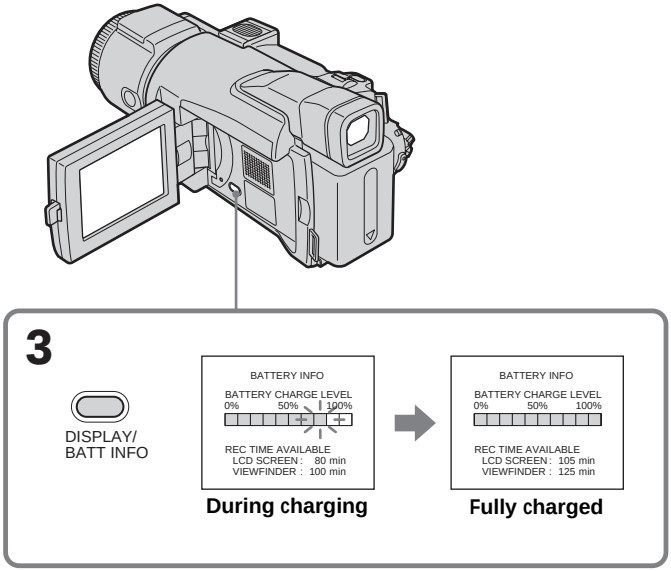
Approximate minutes when you use a fully charged battery pack

Note

Approximate recording time and continuous playing time at 25°C (77°F). The battery life will be shorter if you use your camcorder in a cold environment.

Checking the status of the battery pack – Battery Info

(1) Set the POWER switch to OFF (CHG).
(2) Press OPEN to open the LCD panel.
(3) Press DISPLAY/BATT INFO.
The battery charge level (the percentage of the current remaining battery time to the recording time when fully charged) and remaining battery time when using the LCD screen or viewfinder are displayed for about seven seconds. If you keep pressing DISPLAY/BATT INFO, the indicator is displayed for about 20 seconds.



Note

The BATT INFO indicator may not be displayed in the following cases:
– The battery pack is not properly installed.
– Something is wrong with the battery pack.
– The battery is discharged completely.

Battery Info

The number displayed as Battery Info is the approximate recording time.

While the remaining battery time is being calculated

"CALCULATING BATTERY INFO..." is displayed.

Connecting to a wall outlet

Connect your camcorder to a wall outlet the way described in “Charging the battery pack” on page 16. You can go on using your camcorder without fear of the battery running out.

PRECAUTION

The set is not disconnected from the AC power source (house current) as long as it is connected to the wall outlet, even if the set itself has been turned off.

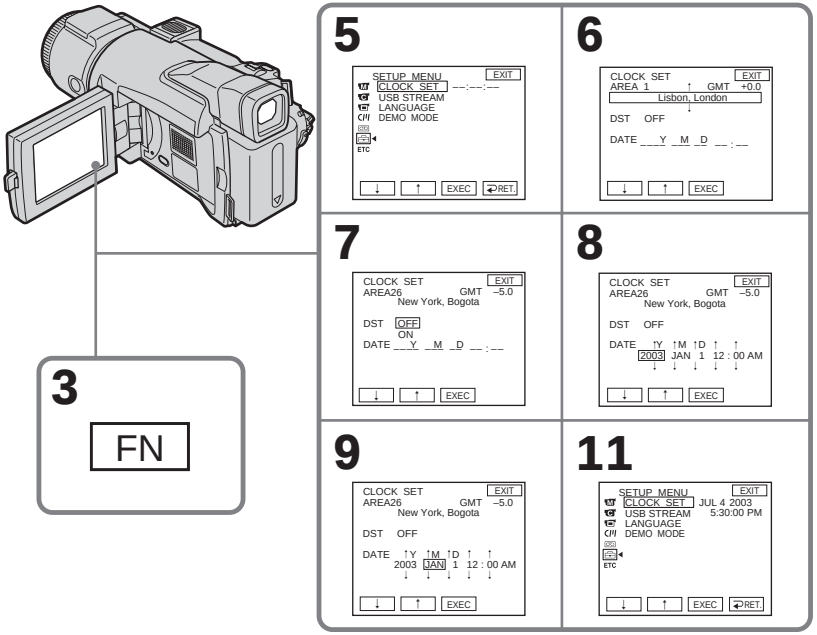
Notes

- The AC Adaptor can supply power from a wall outlet even if the battery pack is attached to your camcorder.
- The DC IN jack has “source priority.” This means that the battery pack cannot supply any power if the power cord is connected to the DC IN jack, even when the power cord is not plugged into a wall outlet.

Step 2 Setting the date and time

Set the date and time when you use your camcorder for the first time. The “CLOCK SET” indicator will appear each time you set the POWER switch to CAMERA or MEMORY unless you set the date and time settings.
If you do not set the date and time, “--- -- ----” and “--:--:--” are recorded on the tape or the “Memory Stick” as the data code.
If you do not use your camcorder for **about three months**, the date and time settings may be cleared from memory (bars may appear) because the built-in rechargeable battery installed in your camcorder will have been discharged (p. 204). In this case, charge the built-in rechargeable battery, then set your area, the daylight saving time (DST*), the year, the month, the day, the hour and the minute.
* Instead of DST, SUMMERTIME is displayed on the screen for some models.

(1) Set the POWER switch to CAMERA or MEMORY.
(2) Press OPEN to open the LCD panel.
(3) Press FN (Function) to display PAGE1 (p. 23).
(4) Press MENU.
(5) Press ↓/↑ to select [toolbox], then press EXEC.
(6) Press ↓/↑ to select CLOCK SET, then press EXEC.
(7) Press ↓/↑ to select your area, then press EXEC.
(8) Press ↓/↑ to select whether your area is in the daylight saving time or not, then press EXEC.
(9) Press ↓/↑ to select a desired year, then press EXEC.
(10) Set the month, day and hour with the same procedure as Step 8.
(11) Press ↓/↑ to set the minute, then press EXEC by the time signal. The clock starts to move.



To return to FN (Function)

Press EXIT.

When using your camcorder abroad

Set the clock to the local time (p. 22).

If you use your camcorder in an area where daylight saving time is used

Set DST SET in ETC to ON in the menu settings.

Note on the time indicator

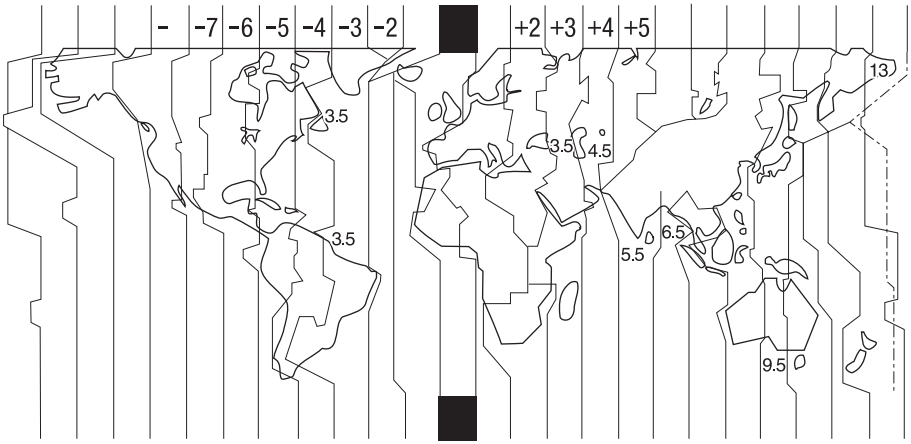
The internal clock of your camcorder operates on a 12-hour cycle.

- 12:00 AM stands for midnight.
- 12:00 PM stands for noon.

Simple setting of clock by time difference

You can easily set the clock to the local time by setting a time difference. Select AREA SET and DST SET* in ETC in the menu settings.
See page 181 for details.
* Instead of DST, SUMMERTIME is displayed on the screen for some models.

World time difference



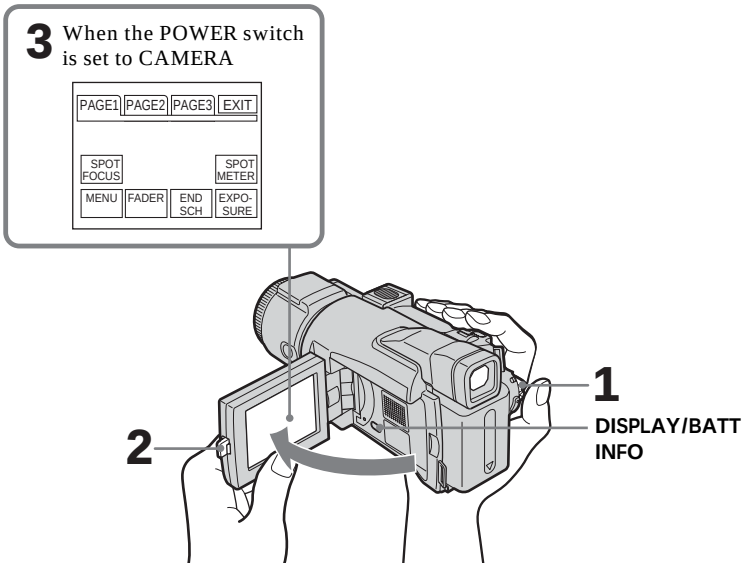
Area code	Time-zone differences	Area setting
1	GMT	Lisbon, London
2	+01:00	Berlin, Paris
3	+02:00	Helsinki, Cairo
4	+03:00	Moscow, Nairobi
5	+03:30	Tehran
6	+04:00	Abu Dhabi, Baku
7	+04:30	Kabul
8	+05:00	Karachi, Islamabad
9	+05:30	Calcutta, New Delhi
10	+06:00	Almaty, Dhaka
11	+06:30	Rangoon
12	+07:00	Bangkok, Jakarta
13	+08:00	HongKong, Singapore
14	+09:00	Seoul, Tokyo
15	+09:30	Adelaide, Darwin
16	+10:00	Melbourne, Sydney

Area code	Time-zone differences	Area setting
17	+11:00	Solomon Is.
18	+12:00	Fiji, Wellington
19	–12:00	Eniwetok, Kwajalein
20	–11:00	Midway Is., Samoa
21	–10:00	Hawaii
22	–09:00	Alaska
23	–08:00	LosAngeles, Tijuana
24	–07:00	Denver, Arizona
25	–06:00	Chicago, MexicoCity
26	–05:00	New York, Bogota
27	–04:00	Santiago
28	–03:30	St. John's
29	–03:00	Brasilia, Montevideo
30	–02:00	Fernando de Noronha
31	–01:00	Azores

Step 3 Using the touch panel

Your camcorder has operation buttons on the LCD screen.
Touch the LCD screen directly with your finger or the supplied stylus (DCR-TRV70 only) to operate each function.

(1) Set the POWER switch to CAMERA to record, VCR to play back or MEMORY to use a "Memory Stick."
(2) Press OPEN to open the LCD panel.
(3) Press FN. Operation buttons on PAGE1 are displayed on the LCD screen.
(4) Press PAGE2/PAGE3 to display PAGE2/PAGE3. Operation buttons on PAGE2/PAGE3 are displayed on the LCD screen.
(5) Press a desired operation item. See relevant pages of this manual for each function.



To return to FN
Press EXIT.

To execute settings
Press ↵ OK. The display returns to PAGE1/PAGE2/PAGE3.

To cancel settings
Press ↵ OFF. The display returns to PAGE1/PAGE2/PAGE3.

To make screen indicators disappear
Press DISPLAY/BATT INFO.

Operation buttons on each display

When the POWER switch is set to CAMERA

PAGE1	SPOT FOCUS, MENU, FADER, END SCH, SPOT METER, EXPOSURE
PAGE2	SELFTIMER, DIG EFFT, LCD BRT, VOL, MEM MIX
PAGE3	SUPER NS, COLOR SLW S, PRGRE REC

When the POWER switch is set to VCR

PAGE1	MENU, LCD BRT, VOL, END SCH
PAGE2	PB ZOOM, DIG EFFT, DATA CODE
PAGE3	V SPD PLAY, A DUB CTRL, REC CTRL

When the POWER switch is set to MEMORY

During memory camera

PAGE1	SPOT FOCUS, MENU, PLAY, PB FOLDR, SPOT METER, EXPOSURE
PAGE2	SELFTIMER, PLAY, MEM MIX
PAGE3	LCD BRT, PLAY, VOL

During memory playback

PAGE1	MENU, CAM, PB FOLDR, DEL
PAGE2	PB ZOOM, CAM, RESIZE, DATA CODE
PAGE3	LCD BRT, CAM, VOL

Notes

- When using the touch panel, press operation buttons lightly with your finger or the supplied stylus (DCR-TRV70 only) supporting the LCD panel from the back side of it.
- Do not press the LCD screen with sharp-pointed objects other than the supplied stylus. (DCR-TRV70 only)
- Do not press the LCD screen too hard.
- Do not touch the LCD screen with wet hands.
- If FN is not on the LCD screen, touch the LCD screen lightly to make it appear. You can control the display with DISPLAY/BATT INFO on your camcorder.

While executing each item

The green bar appears above the item.

If the items are not available

The color of the items changes to gray.

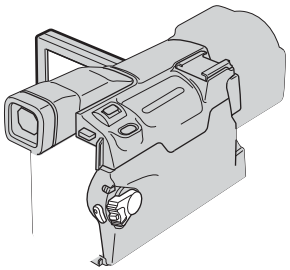
Touch panel

You can operate with the touch panel using the viewfinder (p. 69).

Recording a picture

Follow the procedures in “Step 1” and “Step 2” (p. 15 to 22) beforehand.

(1) Remove the lens cap and pull the lens cap string to fix it.
(2) Prepare the power source (p. 15 to 19) and insert a cassette (p. 8).
(3) Set the POWER switch to CAMERA while pressing the small green button. This sets your camcorder to standby.
(4) Press OPEN to open the LCD panel. The picture appears on the screen.
(5) Press START/STOP. Your camcorder starts recording. The REC indicator appears. The camera recording lamp located on the front of your camcorder lights up. To stop recording, press START/STOP again.



Self-timer recording

If you record with the self-timer, your camcorder automatically starts recording on a tape after counting down for about 10 seconds. See page 48 for details.

Note on recording

Your camcorder records and plays back in the SP (standard play) mode and in the LP (long play) mode. Select SP or LP in ⧈ in the menu settings (p. 179). In the LP mode, you can record **1.5 times** as long as in the SP mode.
When you record a tape in the LP mode on your camcorder, we recommend playing back the tape on your camcorder.

To enable smooth transition

Transition between the last scene you recorded and the next scene is smooth as long as you do not eject the cassette even if you turn off your camcorder.
However, check the following:
– Do not mix recordings in the SP mode and in the LP mode on one tape.
– When you change the battery pack, set the POWER switch to OFF (CHG).

Notes

- The recording data (date / time or various settings when recorded) is not displayed during recording. However, it is recorded automatically on the tape. To display the recording data, press DATA CODE during playback. You can also use the Remote Commander for this operation (p. 40).
- Be careful not to touch the microphone.

If you leave your camcorder in standby for five minutes while the cassette is inserted

Your camcorder automatically turns off. This is to save battery power and to prevent the battery pack and tape from wearing. To return to standby, set the POWER switch to OFF (CHG) and then back to CAMERA. However, your camcorder does not turn off automatically while the cassette is not inserted.

When you record in the SP mode and in the LP mode on one tape or you record in the LP mode

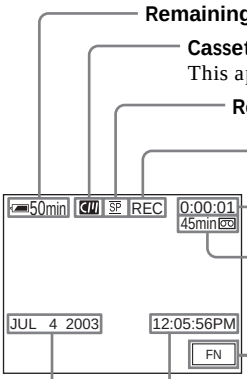
- The transition between scenes may not be smooth.
- The playback picture may be distorted or the time code may not be written properly between scenes.

Note on the LOCK switch

When you set the LOCK switch to the right, the POWER switch can no longer be set to MEMORY accidentally. The LOCK switch is set to the left as the default setting.

Indicators displayed during recording

Indicators are not recorded on the tape.



Remaining battery time

Cassette Memory
This appears when using a cassette with Cassette Memory.

Recording mode

STBY/REC

Time code/Tape counter

Remaining tape
This appears after you insert a cassette.

FN button
Press this button to display operation buttons on the LCD screen.

Time
The time is displayed about five seconds after the power is turned on.

Date
The date is displayed about five seconds after the power is turned on.

Remaining battery time indicator during recording
The remaining battery time indicator roughly indicates the continuous recording time. The indicator may not be correct, depending on the conditions in which you are recording. When you close the LCD panel and open it again, it takes about one minute for the correct remaining battery time in minutes to be displayed.

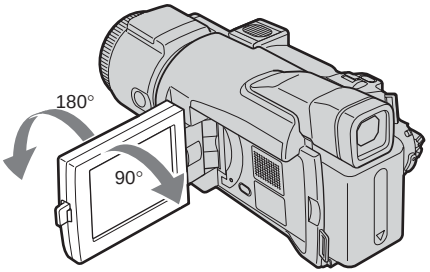
Time code
The time code indicates the recording or playback time, “0:00:00” (hours : minutes : seconds) in CAMERA and “0:00:00:00” (hours : minutes : seconds : frames) in VCR. You cannot rewrite only the time code.

Recording data
The recording data (date / time or various settings when recorded) is not displayed during recording. However, it is recorded automatically on the tape. To display the recording data, press DATA CODE during playback. You can also use the Remote Commander for this operation (p. 40).

After recording

(1) Set the POWER switch to OFF (CHG).
(2) Close the LCD panel.
(3) Eject the cassette.
(4) Remove the power source.

Adjusting the LCD screen



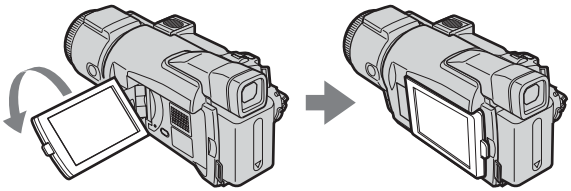
When you adjust the angle of the LCD panel, make sure if the LCD panel is opened up to 90 degrees.

Notes

- When using the LCD screen except in the mirror mode, the viewfinder automatically turns off.
- When you turn the LCD panel over and move it back to your camcorder body with the LCD screen facing out during recording or recording standby, the brightness of the LCD screen is fix to BRT NORMAL.

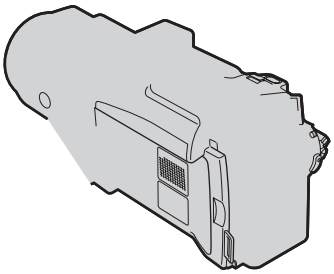
When monitoring on the LCD screen

You can turn the LCD panel over and move it back to your camcorder body with the LCD screen facing out.



Shooting with the mirror mode

This feature allows the camera subject to view him-or herself on the LCD screen.
The subject uses this feature to check his or her own image on the LCD screen while you look at the subject in the viewfinder.



Picture in the mirror mode

The picture on the LCD screen is a mirror-image. However, the picture will be normal when recorded.

Adjusting the brightness of the LCD screen

(1) When the POWER switch is set to CAMERA, press FN and select PAGE2.
When the POWER switch is set to VCR, press FN to display PAGE1.
When the POWER switch is set to MEMORY, press FN and select PAGE3.
(2) Press LCD BRT. The screen to adjust the brightness of the LCD screen appears.
(3) Adjust the brightness of the LCD screen using – (to dim) / + (to brighten).
(4) Press ↩ OK to return to PAGE1 / PAGE2 / PAGE3 in Step 1.

To return to FN

Press EXIT.

LCD screen backlight

You can change the brightness of the backlight. Select LCD B.L. in ⊡ in the menu settings when using the battery pack (p. 175).

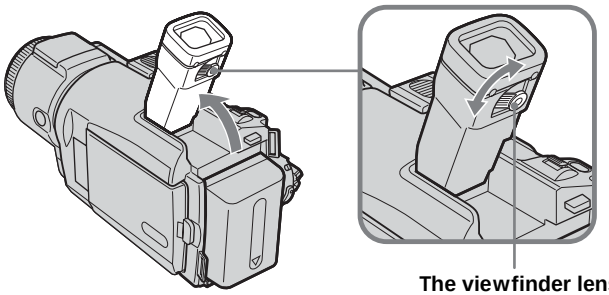
Even if you adjust LCD BRT or LCD B.L.

The recorded picture will not be affected.

Adjusting the viewfinder

If you record pictures with the LCD panel closed, check the picture with the viewfinder. Adjust the viewfinder lens to your eyesight so that the images in the viewfinder come into sharp focus.

Lift up the viewfinder and move the viewfinder lens adjustment lever.



Viewfinder backlight

You can change the brightness of the backlight. Select VF B.L. in in the menu settings when using the battery pack (p. 175).

Even if you adjust VF B.L.

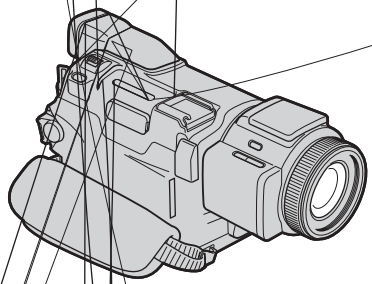
The recorded picture will not be affected.

Using the viewfinder during recording is recommended in the following cases:

– When checking images on the LCD screen is difficult.
– When you fear the battery running out.

Attaching the supplied lens hood

To record fine pictures under strong light, we recommend attaching the lens hood. Also the lens cap can be attached even with the lens hood on.



Note

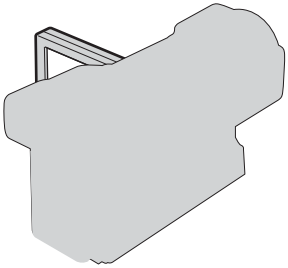
You cannot attach filters or other objects onto the lens hood.
If you forcibly attach these objects onto the lens hood, you will no longer be able to remove filters or other objects from the hood.

When you use the filter (optional)

The shadow of the lens hood may appear in the corners of the screen.

Using the zoom feature

Move the power zoom lever a little for a slower zoom. Move it further for a faster zoom. Using the zoom sparingly results in better-looking recordings.
W : Wide-angle (The subject appears farther away.)
T : Telephoto (The subject appears closer.)



To use zoom greater than 10×

Zoom greater than 10× is performed digitally. Digital zoom can be set to 20× or 120×. To activate digital zoom, select the digital zoom power in D ZOOM in in the menu settings (p. 174). The digital zoom is set to OFF as a default setting.
The picture quality deteriorates because the picture is processed digitally.

The right side of the bar shows the digital zooming zone.
The digital zooming zone appears when you select the digital zoom power in the menu settings.

When you shoot close to a subject

If you cannot get a sharp focus, move the power zoom lever to the “W” side until the focus is sharp. You can shoot a subject that is at least about 80 cm (about 2 5/8 feet) away from the lens surface in the telephoto position, or about 1 cm (about 1/2 inch) away in the wide-angle position.

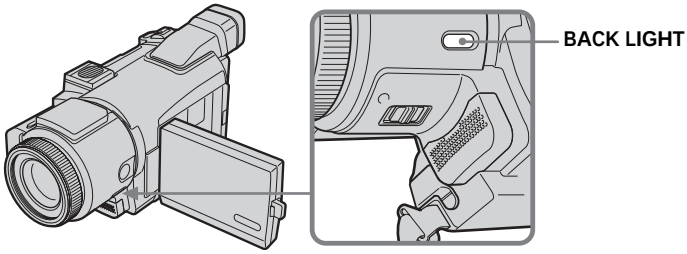
When the POWER switch is set to MEMORY

You cannot use the digital zoom.

Shooting backlit subjects – Back light function

When you shoot a subject with the light source behind the subject or a subject with a light background, use the back light function.

(1) Set the POWER switch to CAMERA or MEMORY.
(2) Press BACK LIGHT.
The indicator appears on the screen.



To cancel the back light function

Press BACK LIGHT again.

When shooting backlit subjects

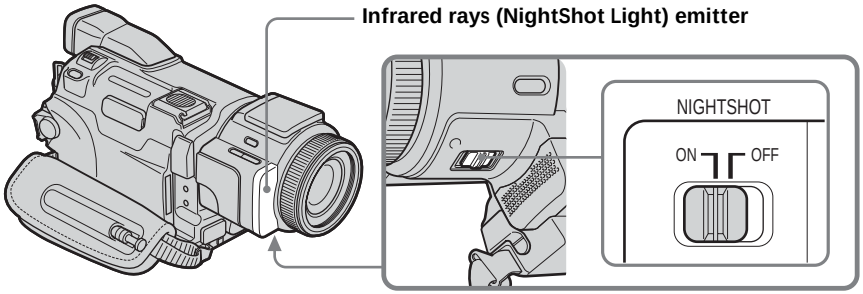
If you set EXPOSURE to MANUAL (p. 61) or select SPOT METER (p. 62), the back light function will be canceled.

Shooting in the dark – NightShot/Super NightShot/Color Slow Shutter

Using NightShot

NightShot enables you to shoot a subject in the night or in a dark place.
When using NightShot, the picture may be recorded in incorrect or unnatural colors.

(1) Set the POWER switch to CAMERA or MEMORY.
(2) Slide NIGHTSHOT to ON.
The and "NIGHTSHOT" indicators flash on the screen.



To cancel NightShot

Slide NIGHTSHOT to OFF.

Using Super NightShot

Super NightShot makes subjects more than 16 times brighter than those recorded using NightShot.

(1) Set the POWER switch to CAMERA.
(2) Slide NIGHTSHOT to ON.
The and "NIGHTSHOT" indicators flash on the screen.
(3) Press FN and select PAGE3.
(4) Press SUPER NS.
The S indicator lights up on the screen.
(5) Press EXIT to return to FN.

To cancel Super NightShot

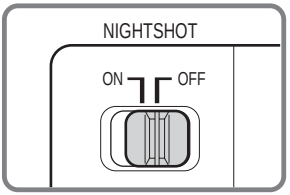
Press SUPER NS again to make the S indicator disappear. To cancel NightShot, slide NIGHTSHOT to OFF.

Using the NightShot Light

The picture will be clearer with the NightShot Light on. To enable the NightShot Light, set N.S. LIGHT in to ON in the menu settings. (The default setting is ON.)

Using Color Slow Shutter

Color Slow Shutter enables you to record color images in a dim place.



(1) Set the POWER switch to CAMERA.
(2) Slide NIGHTSHOT to OFF.
(3) Press FN and select PAGE3.
(4) Press COLOR SLW S.
The indicator lights up on the screen.

To cancel Color Slow Shutter

Press COLOR SLW S again to make the indicator disappear.

Notes

- Do not use NightShot in bright places (e.g. the outdoors in the daytime). This may cause a malfunction.
- While recording using the NightShot Light, attaching the lens hood may block the NightShot Light. Remove the lens hood when you use the NightShot Light.
- If focusing is difficult while recording using NightShot, focus manually.
- While recording using the NightShot Light, do not obstruct the Infrared rays (NightShot Light) emitter with your fingers.

While using NightShot, you cannot use the following functions:
– White balance
– PROGRAM AE
(The indicator flashes.)
– Manual exposure
– Flexible Spot Meter
– HOLOGRAM AF

While using Super NightShot or Color Slow Shutter
The shutter speed is automatically adjusted depending on the brightness. At this time, the motion of the picture may slow down.

While using Super NightShot, you cannot use the following functions:
– White balance
– Fader
– Digital effect
– PROGRAM AE
– Manual exposure
– Flexible Spot Meter
– Recording with the flash
– Progressive Recording Mode

When the POWER switch is set to MEMORY
You cannot use the following functions:
– Super NightShot
– Color Slow Shutter

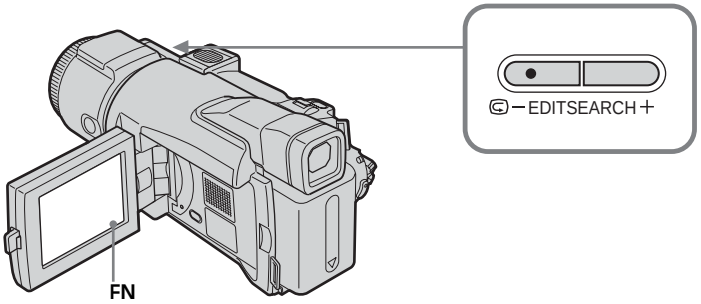
NightShot Light
• Invisible infrared beams of light are used for the NightShot Light. The maximum shooting distance using the NightShot Light is about 3 m (10 feet).
• Attaching the lens hood (supplied) or a conversion lens (optional) may obstruct the infrared rays.

While using Color Slow Shutter, you cannot use the following functions:
– Fader
– Digital effect
– PROGRAM AE
– Manual exposure
– Flexible Spot Meter
– Recording with the flash
– Progressive Recording Mode

In total darkness
Color Slow Shutter may not work normally.

Checking recordings – End search/Edit search/Rec Review

You can use these buttons to check the recorded picture or shoot so that the transition between the last recorded scene and the next scene you record is smooth.



End search

You can go to the end of the recorded section after you record.

(1) Set the POWER switch to CAMERA.
(2) Press FN to display PAGE1.
(3) Press END SCH.
The last five seconds of the recorded section is played back and your camcorder returns to standby.

To return to FN

Press EXIT.

To cancel end search

Press END SCH again.

End search

When you use a cassette without Cassette Memory, End search does not work once you eject the cassette after you have recorded on the tape. If you use a cassette with Cassette Memory, End search works even once you eject the cassette.

If the tape has a blank portion between recorded portions

End search may not work correctly.

Edit search

You can search for the next recording start point. You cannot monitor the sound.

(1) Set the POWER switch to CAMERA.
(2) Hold down EDITSEARCH. The recorded portion is played back.
Release EDITSEARCH to stop playback. If you press START/STOP, recording begins from the point you released EDITSEARCH.
– :To go backwards
\+ :To go forwards

Rec Review

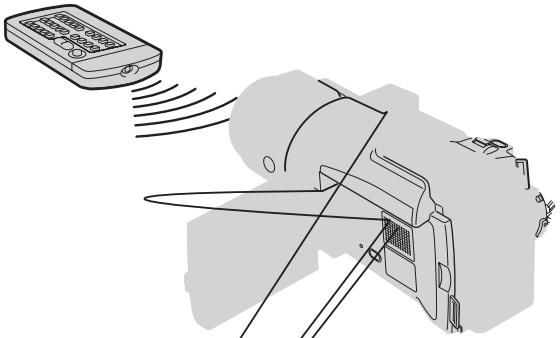
You can check the last recorded section.

(1) Set the POWER switch to CAMERA.
(2) Press the – side of EDITSEARCH momentarily.
The section at which you have stopped recording most recently is played back for a few seconds, and then your camcorder returns to standby.

Playing back a tape

You can monitor the recorded tape on the LCD screen. If you close the LCD panel, you can monitor the playback picture in the viewfinder. You can also control playback using the Remote Commander supplied with your camcorder.

(1) Set the POWER switch to VCR while pressing the small green button.
(2) Press OPEN to open the LCD panel.
(3) Press ◄◄ to rewind the tape.
(4) Press ►II to start playback.
(5) Adjust the volume following the steps below.
① Press FN to display PAGE1.
② Press VOL. The screen to adjust the volume appears.
③ Press – (to turn down the volume)/+ (to turn up the volume).
④ Press ↩ OK to return to PAGE1.



To return to FN
Press EXIT.

To stop playback
Press ■ in the stop state.

To rewind the tape
Press ◄◄ in the stop state.

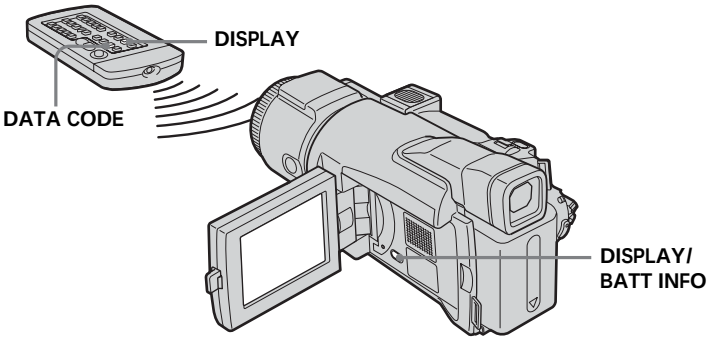
To fastforward the tape
Press ►► in the stop state.

To view a still image (playback pause)
Press ►II during playback. To resume playback, press ►II again. When playback pause lasts for about five minutes, your camcorder automatically enters the stop state.

If you leave the power on for a long time
Your camcorder gets warm. This is not a malfunction.

To display the screen indicators – Display function

Press DISPLAY/BATT INFO on your camcorder or DISPLAY on the Remote Commander supplied with your camcorder.
The indicators disappear from the screen.
To make the indicators appear, press DISPLAY/BATT INFO or DISPLAY on the Remote Commander again.



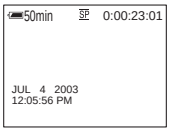
About date/time and various settings

Your camcorder automatically records not only images on the tape but also the recording data (date/time or various settings when recorded) **(Data code)**.
Follow the steps below to display the data code using the touch panel or the Remote Commander.

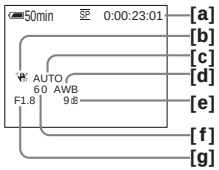
Using the touch panel

(1) Set the POWER switch to VCR, then play back the tape.
(2) During playback, press FN and select PAGE2.
(3) Press DATA CODE.
(4) Select CAM DATA or DATE DATA, then press ↩ OK.
(5) Press EXIT.

Date/time



Various settings



[a] Time code/Tape counter
[b] SteadyShot off
[c] Exposure
[d] White balance
[e] Gain
[f] Shutter speed
[g] Aperture value

Using the Remote Commander

Press DATA CODE on the Remote Commander during playback.
The display changes as follows each time you press DATA CODE:

date / time → various settings (SteadyShot off, exposure, white balance, gain, shutter speed, aperture value) → (no indicator)

To not display the various settings

Set DATA CODE in ETC to DATE in the menu settings (p. 181).
The display changes as follows each time you press DATA CODE on the Remote Commander:
date / time ↔ (no indicator)

Various settings

Various settings show your camcorder's recording information when you recorded. During recording, the various settings are not displayed.

When you use data code, bars (-- -- --) appear if:

– A blank portion of the tape is being played back.
– The tape is unreadable due to tape damage or noise.
– The tape was recorded by a camcorder without the date and time set.

Data code

When you connect your camcorder to a TV, the data code also appears on the TV screen.

Various playback modes

To operate video control buttons, set the POWER switch to VCR.

Using the touch panel

(1) Press FN and select PAGE3.
(2) Press V SPD PLAY to display video control buttons.

To change the playback direction

Press [◄II<] during playback to reverse the playback direction.*

To locate a scene while monitoring the picture (picture search)

Keep pressing [◄◄] or [►►] during playback. To resume normal playback, release the button.

To monitor the high-speed picture while fastforwarding or rewinding the tape (skip scan)

Keep pressing [►►] while fastforwarding or [◄◄] while rewinding the tape. To resume fastforwarding or rewinding, release the button.

To view the picture at slow speed (slow playback)

Press [►] during playback.*
For slow playback in the reverse direction, press [◄II<], then press [►].*

To view the picture at double speed

Press [×2] during playback.*
For double speed playback in the reverse direction, press [◄II<], then press [×2].*

To view the picture frame-by-frame

Press [>II►] during playback pause.**
For frame-by-frame playback in the reverse direction, press [◄II<].**

To search the last recorded scene (END SEARCH)

Press END SCH on PAGE1 in the stop state. The last five seconds of the recorded section is played back, then your camcorder stops.

* Press [► II] to pause playback. Press [► II] to resume normal playback.
** Press [► II] to resume normal playback.

Video control buttons

Marks on your camcorder are different from those on the Remote Commander supplied with your camcorder.

On your camcorder:

- ▶ II To play back or pause the tape
- ■ To stop the tape
- ◀◀ To rewind the tape
- ▶▶ To fastforward the tape
- I▶ To play back the tape slowly
- >II▶ To forward one frame at a time
- ◀II< To rewind one frame at a time
- ×2 To play back the tape at double speed

On the Remote Commander:

- ▶ To play back the tape
- II To pause the tape
- ■ To stop the tape
- ◀◀ To rewind the tape
- ▶▶ To fastforward the tape
- I▶ To play back the tape slowly
- >II▶ To forward one frame at a time
- ◀II< To rewind one frame at a time
- ×2 To play back the tape at double speed

In the various playback modes

- Sound is muted.
- The previous picture may remain as a mosaic image during playback.

When you play back the tape in reverse

Horizontal noise may appear at the center, or the top and bottom of the screen. This is not a malfunction.

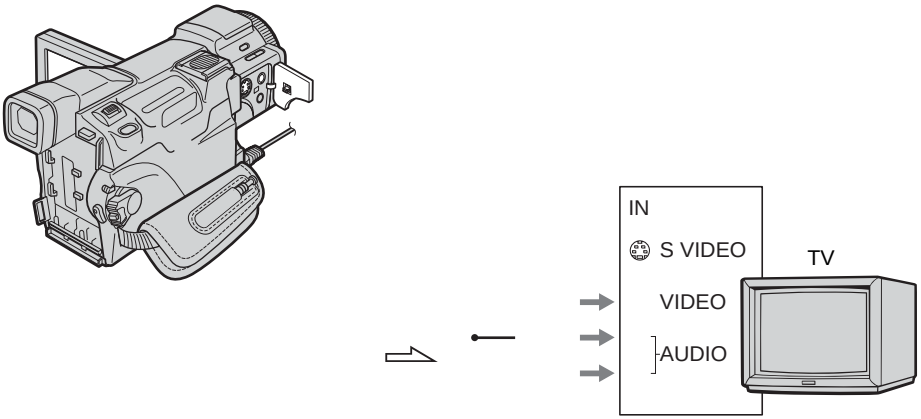
Slow playback

Slow playback can be performed smoothly on your camcorder. However, this function does not work for an output signal from the i.LINK DV Interface.

Viewing a recording on the TV

Connect your camcorder to the TV with the A/V connecting cable supplied with your camcorder to watch the playback pictures on the TV screen. You can operate the video control buttons in the same way as when you view playback pictures on the LCD screen.
When viewing the playback picture on the TV screen, we recommend that you power your camcorder from a wall outlet using the AC Adaptor. Refer to the operating instructions of your TV.

Open the jack cover. Connect your camcorder to the TV with the A/V connecting cable. Then set the TV/VCR selector on the TV to VCR to be able to view images from your camcorder.



If your TV is already connected to the VCR

Connect your camcorder to the LINE IN input on the VCR with the A/V connecting cable supplied with your camcorder. Set the input selector on the VCR to LINE.

If your TV or VCR is a monaural type

Connect the yellow plug of the A/V connecting cable to the video input jack and the white or the red plug to the audio input jack on the VCR or the TV.
If you connect the white plug, the sound is L (left) signal. If you connect the red plug, the sound is R (right) signal.

If the equipment to be connected has an S video jack

- Pictures can be reproduced more faithfully by using an S video cable (optional). With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable.
 Connect the S video cable (optional) to the S video jacks on both your camcorder and the equipment to be connected.
 This connection produces higher quality DV format pictures.
- The sound is not output on the other equipment if your camcorder is connected with an S video cable (optional) only. Use the A/V connecting cable along with an S video cable.

To display the screen indicators on the TV

Set DISPLAY in ETC to V-OUT/LCD in the menu settings (p. 181). To make the screen indicators disappear, press DISPLAY/BATT INFO on your camcorder.

Recording still images on a “Memory Stick” during tape recording standby or tape recording

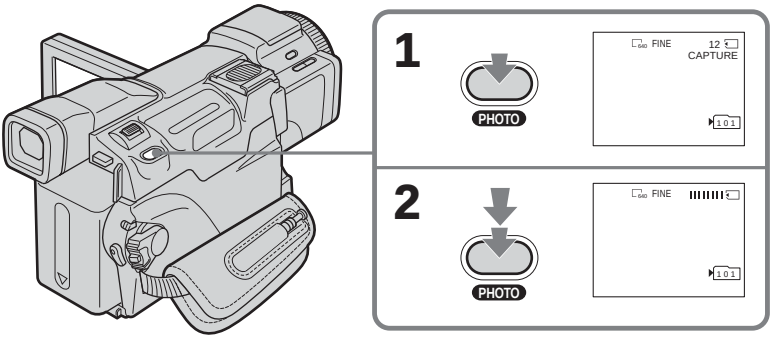
Insert a “Memory Stick” into your camcorder beforehand.

During tape recording standby

The POWER switch should be set to CAMERA.

(1) Keep pressing PHOTO lightly until a still image appears. The CAPTURE indicator appears. Recording does not start yet. To change the still image, release PHOTO, select a still image again, and then press and hold PHOTO lightly.

(2) Press PHOTO deeply.
Recording is complete when the bar scroll indicator disappears.
The image displayed on the screen when you press PHOTO deeply is recorded in the currently displayed folder (p. 129) in the “Memory Stick.”



During tape recording

The POWER switch should be set to CAMERA.

Press PHOTO deeply.
The image displayed on the screen when you press PHOTO deeply is recorded on the “Memory Stick.”
Recording on the “Memory Stick” is complete when the bar scroll indicator disappears.

Note

You cannot record still images on the “Memory Stick” during following operations (The indicator flashes):
– End search
– Wide mode
– While using BOUNCE
– Progressive Recording Mode
– MEMORY MIX

“Memory Stick”

See page 102 for details.

Still images

- Image size is automatically set to 640 × 480.
- If the POWER switch is set to CAMERA, image quality cannot be changed. The image quality when you have set the POWER switch to MEMORY is used (p. 105).
- When recording images with a higher quality, we recommend using the Memory Photo recording (p. 109).

While and after recording still images on the “Memory Stick”

Your camcorder continues recording on the tape.

When you press PHOTO on the Remote Commander

Your camcorder immediately records the image that is on the screen when you press the button.

To record still images on a “Memory Stick” during tape recording

You cannot check an image on the screen by pressing PHOTO lightly. The image when you press PHOTO will be recorded on the “Memory Stick.”

Title

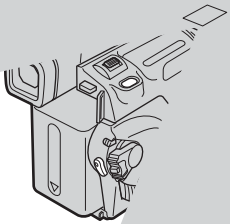
You cannot record the titles.

Self-timer recording

During recording standby, you can record still images on the “Memory Stick” with the self-timer. See page 48 for details.

Recording with the flash

During recording standby, you can record still images on the “Memory Stick” with the flash. See page 113 for details.



Recording on a tape

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Operate by touch

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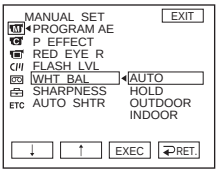
Wh
T

Adjusting the white balance manually

Normally the white balance is automatically adjusted.

The POWER switch should be set to (CAMERA) or (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select WHT BAL in [M], then press EXEC.



(4) Select a desired mode, then press EXEC.

HOLD:
When recording a single-colored subject or background.

OUTDOOR (☀):
- When recording a sunset / sunrise, just after sunset, just before sunrise, neon signs, or fireworks.
- Under daylight fluorescent lamps

INDOOR (☼):
- When lighting conditions change quickly.
- In too bright places such as photography studios
- Under sodium lamps or mercury lamps

To return to FN

Press EXIT.

To return to the automatic white balance

Set WHT BAL to AUTO.

If the picture is being taken in a studio lit by TV lighting
We recommend that you record in the INDOOR mode.

When you record under fluorescent lighting
Select AUTO or HOLD.
Your camcorder may not adjust the white balance correctly in the INDOOR mode.

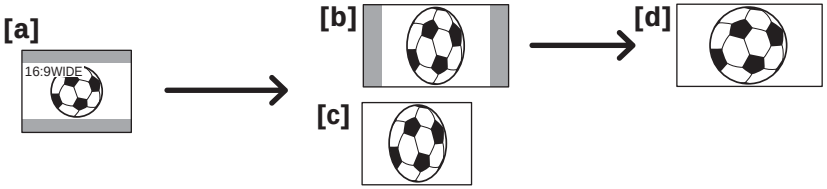
In the AUTO mode
Point your camcorder at the white subject for about 10 seconds after setting the POWER switch to CAMERA to get better adjustment when:
– You remove the battery pack for replacement.
– You bring your camcorder outdoors from the interior of a house holding the exposure, or vice versa.

In the HOLD mode
Set WHT BAL to AUTO and reset to HOLD after few seconds when:
– You change the mode of PROGRAM AE.
– You bring your camcorder outdoors from the interior of a house, or vice versa.

Using the wide mode

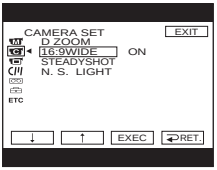
You can enjoy recording with wider angles compared to the normal tape recording while the power zoom lever is moved to the “W” side.
You can record a 16:9 wide picture to watch on a 16:9 wide-screen TV (16:9WIDE). Black bands appear on the screen during recording in the 16:9WIDE mode **[a]**. The picture during playing back in the 4:3 mode on a wide-screen TV **[b]** or a normal TV **[c]*** is compressed in the widthwise direction. If you set the screen mode of the wide-screen TV to the full mode, you can watch pictures of normal images **[d]**.

* The picture played back in the wide mode on a normal TV appears the same as the picture played back in the wide mode on your camcorder **[a]**.



The POWER switch should be set to CAMERA.
Operate by touching the panel.

(1) During recording standby, press FN to display PAGE1.
(2) Press MENU.
(3) Select 16:9WIDE in , then press EXEC.
(4) Select ON, then press EXEC.



To return to FN
Press EXIT.

To cancel the wide mode
Set 16:9WIDE to OFF.

Notes

- In the wide mode, you cannot operate the following functions:
 – Recording still images on the “Memory Stick” during tape recording or tape recording standby
 – BOUNCE
 – OLD MOVIE
 – Progressive Recording Mode
- Pictures recorded in the wide mode on the tape cannot be changed to normal size.

Connection for a TV

Pictures recorded in the 16:9WIDE mode automatically appear on the TV screen at full size when:

– You connect your camcorder to a TV compatible with the video ID (ID-1 / ID-2) system.
– You connect your camcorder to the S video jack on a TV.

ID-1 system

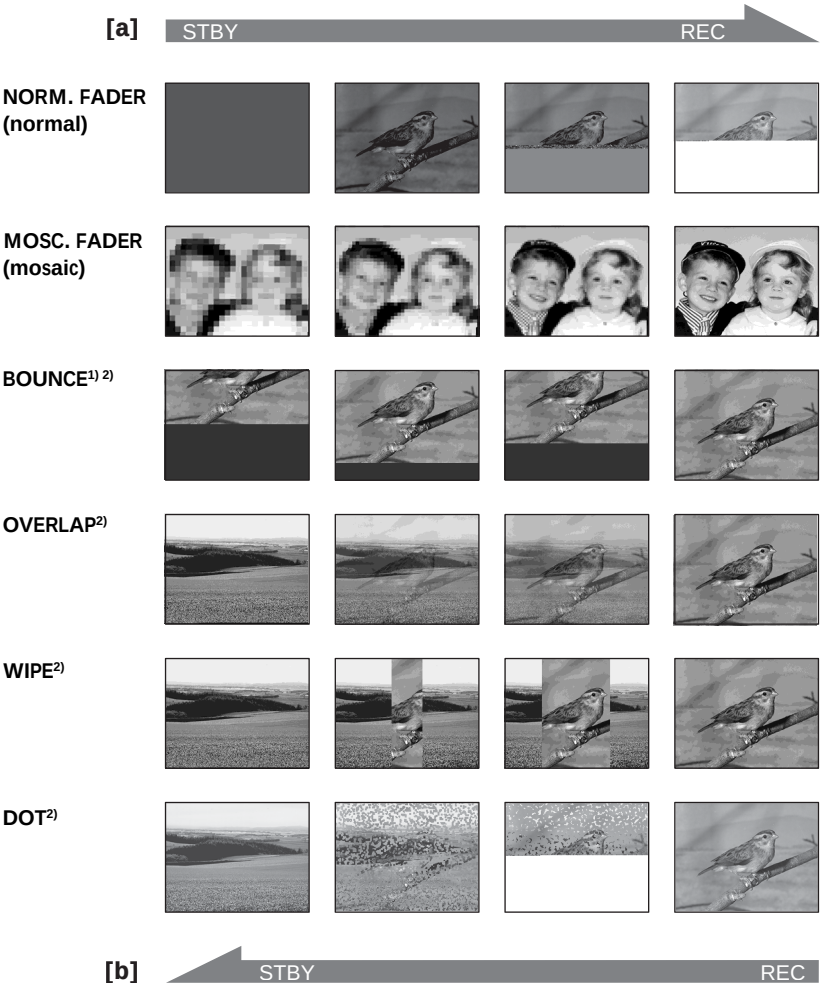
The ID-1 system sends aspect ratio information (16:9, 4:3, or letter box) with video signals. If you connect a TV compatible with the ID-1 system, the screen size is automatically selected.

ID-2 system

The ID-2 system sends a copyright protection signal with ID-1 signals inserted between video signals when you connect your camcorder to other equipment using the A / V connecting cable.

Using the fader function

You can fade in or out to give your recording a professional appearance.



MONOTONE
When fading in, the picture gradually changes from black-and-white to color.
When fading out, the picture gradually changes from color to black-and-white.

1) You can use BOUNCE when D ZOOM in is set to OFF in the menu settings.
2) You can fade in only.

Using the fader function

The POWER switch should be set to CAMERA.

Operate by touching the panel.

(1) When fading in [a]
Press FN to display PAGE1 during recording standby.
When fading out [b]
Press FN to display PAGE1 during recording.

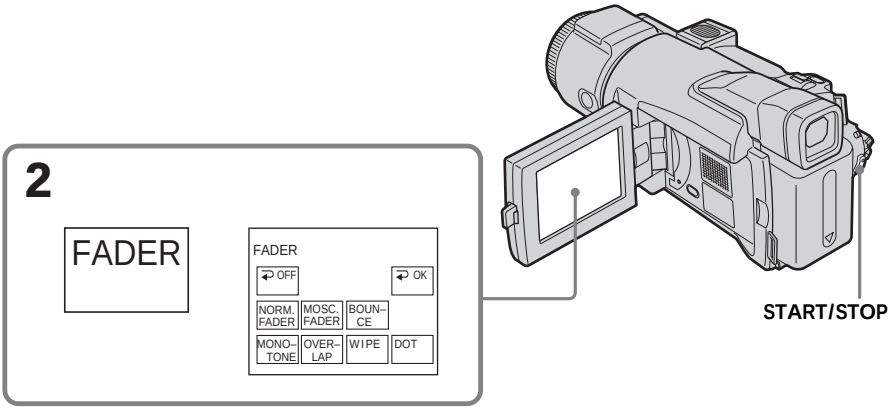
(2) Press FADER. The screen to select the fader mode appears.

(3) Press a desired mode.

(4) Press ⮐ OK to return to PAGE1.

(5) Press EXIT to return to FN.
The fader indicator you selected flashes.

(6) Press START/STOP.
After the fade in/out is carried out, your camcorder automatically returns to the normal mode.



To cancel the fade in/out

Before pressing START/STOP, press ⮐ OFF on the FADER screen to return to PAGE1.

Note

You cannot use the following functions while using fader. Also, you cannot use fader while using following functions:
– Super NightShot
– Color Slow Shutter
– Digital effect
– Recording with the flash
– Interval Recording
– Frame recording

When you select OVERLAP, WIPE or DOT

Your camcorder automatically stores the image recorded on the tape. As the image is being stored, the image on the screen disappears.

While using BOUNCE, you cannot use the following functions:

– Zoom
– Picture effect
– PROGRAM AE
– Manual exposure
– Flexible Spot Meter
– Manual focus
– Recording still images on the “Memory Stick”

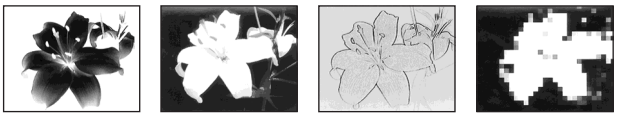
Note on the BOUNCE mode

You cannot select BOUNCE in the followings:
– When D ZOOM is activated in the menu settings.
– Wide mode
– Picture effect
– PROGRAM AE
– Progressive Recording Mode

Using special effects – Picture effect

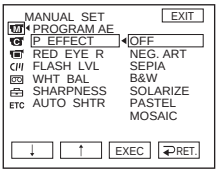
NEG. ART [a] : The color and brightness of the picture are reversed.
SEPIA : The picture appears in sepia.
B&W : The picture appears in monochrome (black-and-white).
SOLARIZE [b] : The picture looks like as an illustration with strong contrast.
PASTEL [c] : The picture looks like a pale pastel drawing.
MOSAIC [d] : The picture appears mosaic-patterned.

[a] **[b]** **[c]** **[d]**



The POWER switch should be set to CAMERA.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select P EFFECT in M, then press EXEC.



(4) Select a desired mode, then press EXEC.

To return to FN
Press EXIT.

To cancel picture effect
Set P EFFECT to OFF.

Note
While using picture effect, you cannot use following functions:
– BOUNCE
– OLD MOVIE

Using special effects – Digital effect

SLOW SHTR (slow shutter)
You can slow down the shutter speed. The SLOW SHTR mode is suitable for shooting a subject in a dark place more brightly.

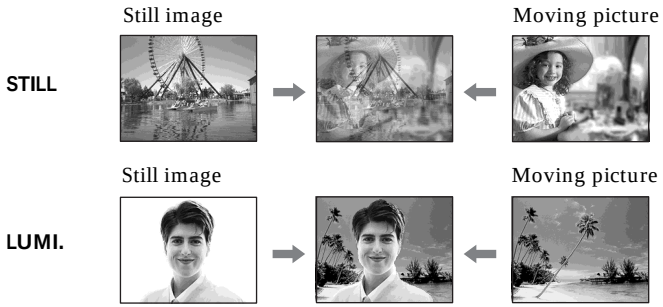
STILL
You can record a still image so that it is superimposed on a moving picture.

OLD MOVIE
You can add an old movie type atmosphere to pictures. Your camcorder automatically sets the 16:9WIDE mode to ON, picture effect to SEPIA, and sets the appropriate shutter speed.

FLASH (flash motion)
You can record still images successively at regular intervals.

LUMI. (luminance key)
You can swap the brighter area in a still image with a moving picture.

TRAIL
You can record a picture so that an incidental image like a trail is left.



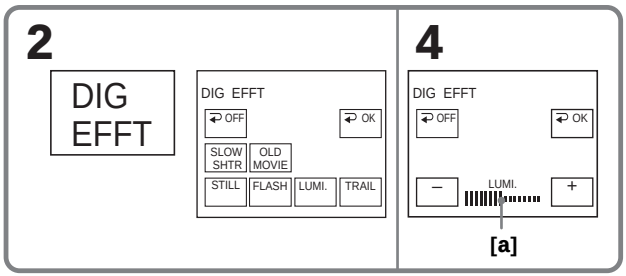
The POWER switch should be set to CAMERA.
Operate by touching the panel.

(1) Press FN and select PAGE2.
(2) Press DIG EFFT. The screen to select a digital effect is displayed.
(3) Press a desired mode. When you select STILL or LUMI., the still image when you have selected the mode is stored in memory.
(4) Press – (to decrease the effect) / + (to increase the effect) to adjust the effect.

Items to adjust

SLOW SHTR	Shutter speed. The larger the shutter speed number, the slower the shutter speed.
STILL	The rate of the still image you want to superimpose on the moving picture
OLD MOVIE	No adjustment necessary
FLASH	The interval of frame by frame playback
LUMI.	The color scheme of the area in the still image which is to be swapped with a moving picture
TRAIL	The vanishing time of the incidental image

(5) Press ↩ OK to return to PAGE2.



[a] The bar appears when setting the following digital effect modes: STILL, FLASH, LUMI., TRAIL.

To return to FN

Press EXIT.

To cancel digital effect

Press ↩ OFF on the DIG EFFT screen to return to PAGE2.

Shutter speed

Shutter speed number	Shutter speed
SLOW SHTR 1	1/30
SLOW SHTR 2	1/15
SLOW SHTR 3	1/8
SLOW SHTR 4	1/4

Notes

- While using digital effect, you cannot use the following functions:
 – Super NightShot
 – Color Slow Shutter
 – Fader
- PROGRAM AE does not work in the SLOW SHTR mode.
- The following functions do not work in the OLD MOVIE mode:
 – Wide mode
 – Picture effect
 – PROGRAM AE

When recording in the SLOW SHTR mode

Autofocus may not be effective. Focus manually using a tripod.

Using PROGRAM AE

SPOTLIGHT *
This mode prevents people's faces, for example, from appearing excessively white when shooting subjects lit by strong light in the theater.

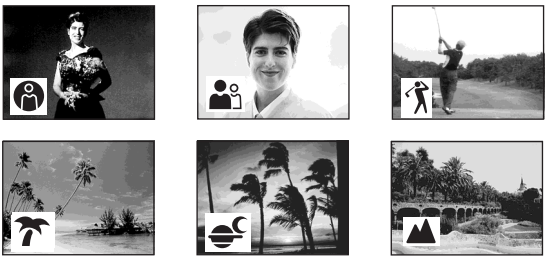
PORTRAIT (soft portrait)
This mode brings out the subject while creating a soft background for subjects such as people or flowers.

SPORTS (sports lesson) *
This mode minimizes shake on fast-moving subjects such as in tennis or golf.

BEACH&SKI *
This mode prevents people's faces from appearing dark in strong light or reflected light, such as at a beach in midsummer or on a ski slope.

SUNSETMOON (sunset & moon) **
This mode allows you to maintain atmosphere when you are recording sunsets, general night views, fireworks displays and neon signs.

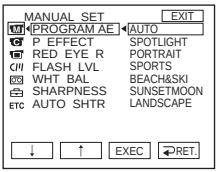
LANDSCAPE **
This mode is for when you are recording distant subjects such as mountains. Also it prevents your camcorder from focusing on glass or metal mesh in windows when you are recording a subject behind glass or a screen.



* Your camcorder focuses only on subjects in the middle to far distance.
** Your camcorder focuses only on distant subject.

The POWER switch should be set to (CAMERA) or (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select PROGRAM AE in [M], then press EXEC.



(4) Select a desired mode, then press EXEC.

To return to FN
Press EXIT.

To cancel PROGRAM AE
Set PROGRAM AE to AUTO.

Notes

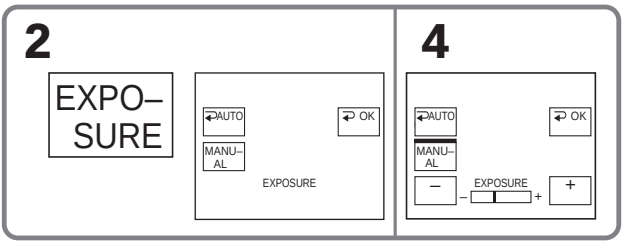
- The following functions do not work while using PROGRAM AE:
 – Color Slow Shutter
 – BOUNCE
 – SLOW SHTR
 – OLD MOVIE
 – Spot Focus
- PROGRAM AE does not work in the following cases (The indicator flashes):
 – NightShot
 – To record images on the “Memory Stick” using MEMORY MIX
- When you set the POWER switch to MEMORY, the SPORTS mode does not work. (The indicator flashes.)

Adjusting the exposure manually

Adjust the exposure manually in the following cases:
– When you need a fine adjustment for backlit subjects.
– When the subject is too bright against the background.
– When recording dark pictures (e.g. night scenes) faithfully.

The POWER switch should be set to CAMERA or MEMORY.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press EXPOSURE. The screen to adjust the exposure appears.
(3) Press MANUAL.
(4) Adjust the exposure using – (to dim) / + (to brighten).
(5) Press ↩ OK to return to PAGE1.



To return to FN
Press EXIT.

To return to the automatic exposure
Press ↩ AUTO on the EXPOSURE screen to return to PAGE1.

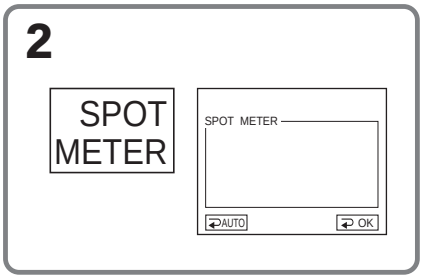
Note
When you adjust the exposure manually, the following functions do not work:
– Back light
– Color Slow Shutter

Using the spot light-metering function – Flexible Spot Meter

You can take a picture with the appropriate exposure automatically adjusted for just the point you want to focus on and with its exposure fixed.
Use Flexible Spot Meter in the following cases:
– The subject is backlit.
– When there is strong contrast between the subject and background such as with a subject that is on stage and lit by a spotlight.

The POWER switch should be set to CAMERA or MEMORY.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press SPOT METER. The SPOT METER screen appears.
(3) Press the desired area in the frame on the screen.
The SPOT METER indicator flashes on the screen. The exposure of the point you selected is adjusted.
(4) Press ⮌ OK to return to PAGE1.



To return to FN
Press EXIT.

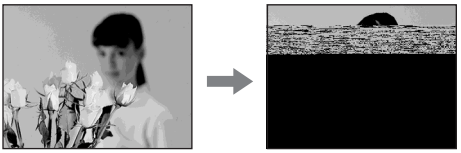
To return to the automatic exposure
Press ⮌ AUTO in the SPOT METER screen to return to PAGE1.

Note
The following functions do not work while using Flexible Spot Meter:
– Back light
– Color Slow Shutter
– Spot focus

Focusing manually

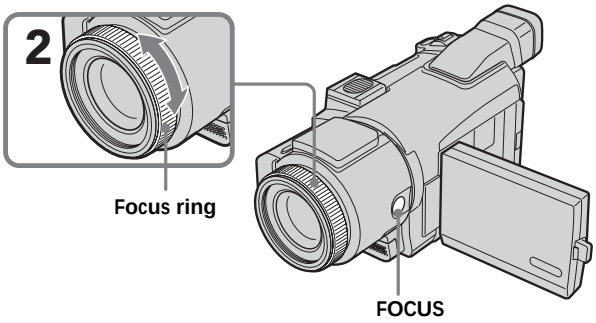
You can gain better results by manually adjusting the focus in the following cases. Normally, focus is automatically adjusted.
When the POWER switch is set to MEMORY, you can adjust the focus manually with the image enlarged to twice the size (Expanded focus).
Adjust the focus manually in the following cases:

- The autofocus mode is not effective when shooting:
 – Subjects through glass coated with water droplets
 – Horizontal stripes
 – Subjects with little contrast with backgrounds such as walls or the sky
- Shooting a stationary subject when using a tripod.
- When you want to change the focus from a subject in the foreground to a subject in the background.



The POWER switch should be set to CAMERA or MEMORY.

(1) Press FOCUS.
The (focus) indicator appears on the screen.
(2) Turn the focus ring to sharpen focus.



To return to the autofocus

Press FOCUS to turn off the , or indicator.

About expanded focus

If you set EXPANDED F in to ON in the menu settings (p. 174) when the POWER switch is set to MEMORY, the (expanded focus) indicator appears. At this time the image is enlarged to approximately twice the size. The focal distance information is also displayed. After adjustment is complete, the image returns to its original size automatically.

To focus precisely

It is easier to focus on the subject if you adjust the zoom to shoot at the "W" (wide-angle) position after focusing at the "T" (telephoto) position.

When you shoot close to the subject

Focus at the end of the "W" (wide-angle) position.

☞ changes as follows:

▲ when recording a distant subject.
▲ when the subject is too close to focus on.

Focal distance information is displayed for about three seconds on the screen in the following cases:

– When switching the focus adjustment mode from autofocus to manual.
– When turning the focus ring.

Focal distance information

You cannot get correct information if you have attached a conversion lens (optional) to your camcorder.

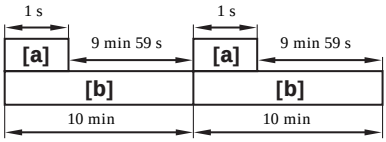
You can take a picture with the appropriate focus automatically adjusted for just the point you want to focus on and with its focus fixed.

The POWER switch should be set to (CAMERA)

Interval Recording

You can make a time-lapse recording by setting your camcorder to automatically record and switch to standby sequentially. You can achieve an excellent recording for flowering, emergence of insects, etc. with this function.

Example



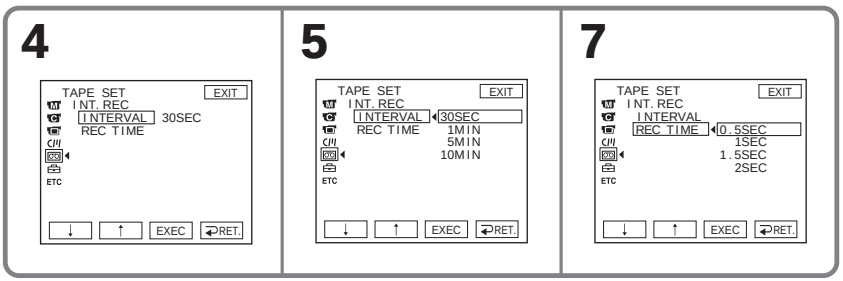
[a] REC TIME
[b] INTERVAL

There may be a discrepancy in recording time of up to +/– six frames from the selected time.

The POWER switch should be set to (CAMERA).

Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select INT. REC in [tape], then press EXEC.
(4) Select SET, then press EXEC.
(5) Select INTERVAL, then press EXEC.
(6) Select a desired interval time, then press EXEC.
The time: 30SEC ⟷ 1MIN ⟷ 5MIN ⟷ 10MIN
(7) Select REC TIME, then press EXEC.
(8) Select a desired recording time, then press EXEC.
The time: 0.5SEC ⟷ 1SEC ⟷ 1.5SEC ⟷ 2SEC
(9) Press ⮌ RET.
(10) Set INT. REC to ON, then press EXEC.
(11) Press EXIT to return to FN.
The INTERVAL TAPE indicator flashes on the screen.
(12) Press START/STOP to start Interval Recording.
The INTERVAL TAPE indicator lights up during Interval Recording.



To cancel Interval Recording

Set INT. REC to OFF.

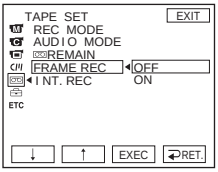
Frame by frame recording – Frame recording

You can make a recording with a stop-motion animated effect using frame recording. To create this effect, alternately move the subject a little and make frame recording. We recommend that you use a tripod, and operate your camcorder using the Remote Commander after Step 6 to prevent camera shake.

The POWER switch should be set to CAMERA.

Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select FRAME REC in , then press EXEC.



(4) Select ON, then press EXEC.
(5) Press EXIT to return to FN.
The FRAME REC indicator lights up.
(6) Press START/STOP to start frame recording. Your camcorder makes a recording for about six frames, and returns to recording standby.
(7) Move the subject, and repeat Step 6.

To cancel frame recording

Set FRAME REC to OFF.

Note

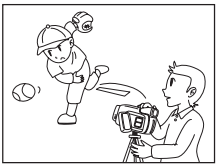
The remaining tape time is not indicated correctly if you use frame recording continuously.

When using frame recording

The last recorded frame is longer than other frames.

Recording with all the pixels – Progressive Recording Mode

To import moving pictures to your computer to view still images, we recommend you record in Progressive Recording Mode. To use Progressive Recording Mode, follow the procedure below. Still images produced this way are more stable than those recorded on a tape in normal mode, and thus are more suitable for analyzing high-speed action such as sports scenes. (Since your camcorder takes in an image every 1/30 of a second in Progressive Recording Mode, moving pictures recorded in this mode may be subject to too much jitter. To view moving pictures, we recommend recording in normal mode.)



The POWER switch should be set to (CAMERA).

Operate by touching the panel.

(1) Press FN and select PAGE3.
(2) Press PRGRE REC.

To cancel the Progressive Recording Mode

Press PRGRE REC again.

To return to FN

Press EXIT.

Note on the Progressive Recording Mode

The normal TV broadcast divides the screen into two finer fields and displays them in turns every 1/60 of a second. Thus, the actual image displayed in an instant covers only half of the apparent image area. Displaying the whole image simultaneously on a full screen is called displaying with all the pixels. In this function the picture is clearer than one in normal function, but moving objects appear jerky since the picture is read/output every about 1/30 second.

When recording under fluorescent light

When recording in the Progressive Recording Mode under fluorescent light or light bulb, a rare phenomenon may happen in which the screen lights up brightly (Flicker phenomenon). This is not a malfunction. If you want to stop this phenomenon, cancel the Progressive Recording Mode.

When you record with Progressive Recording Mode

The angle of view is slightly larger than normal recording.

While in Progressive Recording Mode, you cannot use the following functions:

– Digital Zoom
– Wide mode
– BOUNCE
– Slow Shutter
– OLD MOVIE
– Recording still images on a “Memory Stick” during tape recording standby or tape recording
– SteadyShot

Using the viewfinder

Turn the LCD panel over and move it back to your camcorder body with the LCD screen facing out. You can operate with the touch panel using the viewfinder.
Use the viewfinder when operating camera brightness and fader on the touch panel.

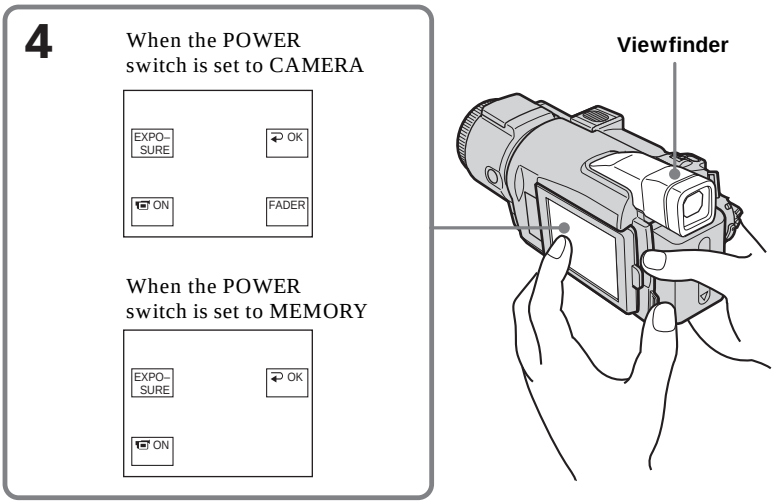
The POWER switch should be set to CAMERA or MEMORY.
Operate by touching the panel.

(1) Turn the LCD panel over and move it back to your camcorder body with the LCD screen facing out.
(2) Press ☎ OFF. The PANEL OFF indicator appears on the screen.
(3) Press OK. The LCD screen is turned off.
(4) Using the viewfinder, press the LCD screen. EXPOSURE, ↩ OK, ☎ ON and FADER (only when the POWER switch is set to CAMERA) appear.
(5) Press the LCD screen and select a desired item, then press ↩ OK.

EXPOSURE: Adjust the exposure by pressing –/+.
FADER: Press FADER repeatedly until a desired fader mode appears.
The indicator changes as follows:

FADER → M. FADER → BOUNCE → MONOTONE
(no indicator) ← DOT ← WIPE ← OVERLAP

☎ ON: The LCD screen lights up.



To make the buttons on the LCD screen disappear

Press ↩ OK.

Note

When the POWER switch is set to VCR or during memory playback, you cannot operate with the touch panel using the viewfinder.

To operate the items that do not appear

Set the LCD panel back to the normal position. Operate the items using the LCD screen.

Available recording time

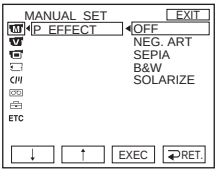
This is the time when you record pictures using the viewfinder (p. 17).

Playing back a tape with picture effect

The POWER switch should be set to VCR.

Operate by touching the panel.

(1) During playback or playback pause, press FN to display PAGE1.
(2) Press MENU.
(3) Select P EFFECT in , then press EXEC.



(4) Select a desired mode, then press EXEC.
You can use NEG. ART, SEPIA, B&W and SOLARIZE.
See page 55 for details on each mode.

To return to FN

Press EXIT.

To cancel picture effect

Set P EFFECT to OFF.

Notes

- You cannot process externally input scenes using picture effect.
- You cannot record images processed with picture effect on the tape on your camcorder. Record the processed images on the “Memory Stick” (p. 116, 125), or on a VCR using your camcorder as a player.

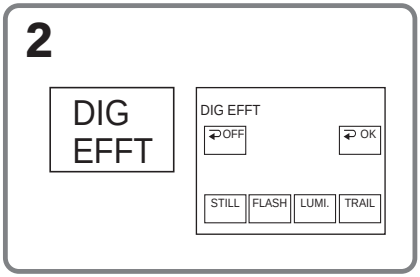
Pictures processed with picture effect

Pictures processed with picture effect are not output through the i.LINK DV Interface.

Playing back a tape with digital effect

The POWER switch should be set to (VCR).
Operate by touching the panel.

(1) During playback or playback pause, press FN and select PAGE2.
(2) Press DIG EFFT. The screen to select a digital effect is displayed.
(3) Select a desired mode. You can use STILL, FLASH, LUMI. and TRAIL. See pages 56, 57 for details on each mode. When you select STILL or LUMI., the picture where you select the mode is stored in memory as a still image.
(4) Press –/+ to adjust the effect.
(5) Press ⮌ OK to return to PAGE2.



To return to FN

Press EXIT.

To cancel digital effect

Press ⮌ OFF to return to PAGE2.

Notes

- You cannot process externally input scenes using digital effect.
- You cannot record images processed with digital effect on the tape on your camcorder. Record the processed images on the “Memory Stick” (p. 116, 125), or on a VCR using your camcorder as a player.

Pictures processed with digital effect

Pictures processed with digital effect are not output through the i.LINK DV Interface.

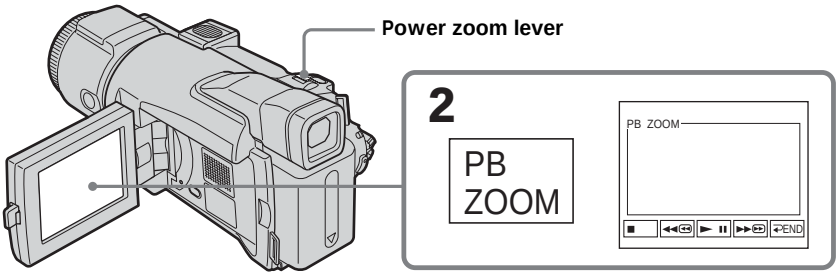
Enlarging images recorded on the tape – Tape PB ZOOM

Besides the operation described here, your camcorder can enlarge still images recorded on the "Memory Stick" (p. 135).

The POWER switch should be set to (VCR).

Operate by touching the panel.

(1) During playback or playback pause, press FN and select PAGE2.
(2) Press PB ZOOM. The PB ZOOM screen appears.
(3) Press the area you want to enlarge in the frame.
The area you have pressed moves to the center of the screen, and the playback image is enlarged to approximately at twice the size. If you press another area again, the area moves to the center of the screen.
(4) Adjust the zoom ratio by the power zoom lever.
You can select the zoom ratio from approximately 1.1 times up to five times its size.
W : To decrease the zoom ratio
T : To increase the zoom ratio



To cancel tape PB ZOOM

Press ⮌ END.

Notes

- You cannot process externally input scenes using tape PB ZOOM with your camcorder.
- You cannot record images processed with tape PB ZOOM on the tape on your camcorder. Record the processed images on a "Memory Stick" (p. 116) or on a VCR using your camcorder as a player.
- You cannot record moving pictures processed with tape PB ZOOM on the "Memory Stick" on your camcorder.

Images in tape PB ZOOM

Images in tape PB ZOOM are not output through the i.LINK DV Interface.

In tape PB ZOOM

If you press DISPLAY/BATT INFO, the frame on the PB ZOOM screen disappears. You cannot move the part you have pressed to the center of the screen.

Edge of the image

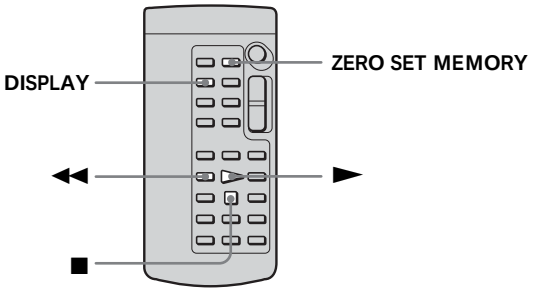
The edge of the image cannot be displayed at the center of the screen.

Quickly locating a scene – Zero set memory

Your camcorder automatically searches for a desired scene having the tape counter value of “0:00:00”. Use the Remote Commander for this operation.

The POWER switch should be set to VCR.

(1) During playback, press ZERO SET MEMORY on the Remote Commander at the point you want to locate later. The tape counter shows “0:00:00”, then starts counting. If the indicators do not appear, press DISPLAY. The ZERO SET MEMORY indicator flashes.
(2) Press ■ when you want to stop playback.
(3) Press ◄◄ to rewind the tape to the tape counter’s zero point. The tape stops automatically when the tape counter reaches approximately zero.
(4) Press ►. Playback starts from the counter’s zero point.



Notes

- When you press ZERO SET MEMORY before rewinding the tape, the zero set memory function will be canceled.
- There may be a discrepancy of several seconds between the time code and the tape counter.
- The ZERO SET MEMORY indicator disappears when you press FN.

If the tape has a blank portion between recorded portions

The zero set memory function may not work correctly.

Searching the boundaries of the recorded tape by title – Title search

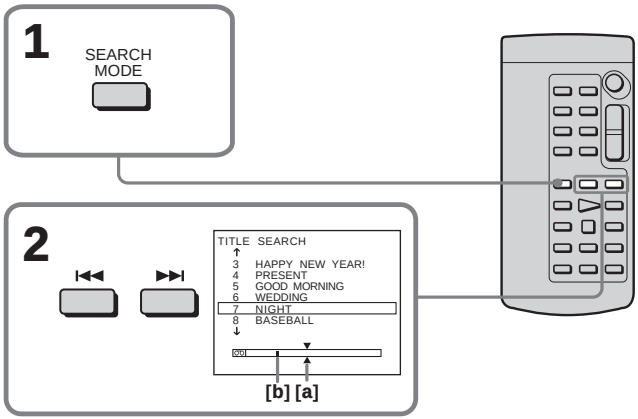
Use a cassette with Cassette Memory for this operation.
Use the Remote Commander for this operation.

Before operation
Set CM SEARCH in [CM] to ON in the menu settings. (The default setting is ON.)

The POWER switch should be set to (VCR).

(1) Press SEARCH MODE on the Remote Commander until the TITLE SEARCH indicator appears.
The TITLE SEARCH screen appears.
The indicator changes as follows:
TITLE SEARCH → DATE SEARCH → (no indicator)

(2) Press ⏮ or ⏭ on the Remote Commander to select the title for playback.
Your camcorder automatically starts playback of the scene having the title that you selected.



[a] Actual point you are trying to search for
[b] Present point on the tape

To cancel searching

Press ■ on the Remote Commander.

If the tape has a blank portion between recorded portions
Title search may not work correctly.

To superimpose a title
See page 97.

Searching a recording by date – Date search

When you search for the date by using Cassette Memory, cue the tape by selecting the recording date on the screen.
When you search for the date without using Cassette Memory, cue the tape to changing point of recording date. Use the Remote Commander for this operation.

Searching for the date by using Cassette Memory

Before operation

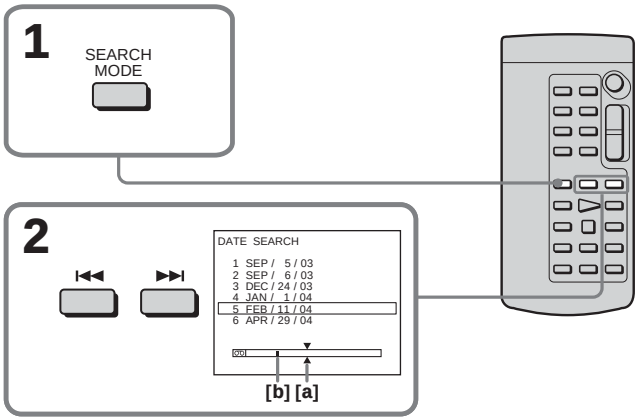
- You can use this function only when playing back a cassette with Cassette Memory.
- Set CM SEARCH in [CM] to ON in the menu settings. (The default setting is ON.)

The POWER switch should be set to (VCR).

(1) Press SEARCH MODE on the Remote Commander repeatedly until the DATE SEARCH indicator appears.
The DATE SEARCH screen appears.
The indicator changes as follows:

→ TITLE SEARCH → DATE SEARCH → (no indicator)

(2) Press ⏮ or ⏭ on the Remote Commander to select the date for playback. Your camcorder automatically starts playback at the beginning of the selected date.



[a] Actual point you are trying to search for
[b] Present point on the tape

To cancel searching

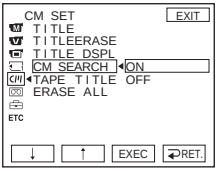
Press ■ on the Remote Commander.

Searching for the date without using Cassette Memory

The POWER switch should be set to VCR.

Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select CM SEARCH in CM, then press EXEC.



(4) Select OFF, then press EXEC.
(5) Press SEARCH MODE on the Remote Commander until the DATE SEARCH indicator appears.
(6) Press ⏮ on the Remote Commander to search for the previous date or press ⏭ on the Remote Commander to search for the next date. Your camcorder automatically starts playback at the point where the date changes. Each time you press ⏮ or ⏭, your camcorder searches for the previous or next date.

To cancel searching

Press ■ on the Remote Commander or ■ on your camcorder.

Note

If one day's recording is less than two minutes, your camcorder may not accurately find the point where the recording date changes.

If the tape has a blank portion between recorded portions

Date search may not work correctly.

Cassette Memory

The cassette with Cassette Memory can hold six recording date data. If you search the date among seven or more data, see "Searching for the date without using Cassette Memory."

Dubbing a tape

You can dub or edit on the VCR connected to your camcorder using your camcorder as a player.
You can connect either the A / V connecting cable (supplied) or i.LINK cable (optional). If you connect with the i.LINK cable (optional), video and audio signals are transmitted in digital form for high-quality editing.
Titles, screen indicators, Cassette Memory contents, and letters on the “Memory Stick” index screen cannot be recorded.

Connecting to the VCR

You can edit on VCRs that support the following systems:
8 mm 8, Hi8 Hi8, Digital8 8, VHS VHS, S-VHS S-VHS, VHSC VHSC, S-VHSC S-VHSC, Betamax Beta, ED Betamax ED Beta, mini DV Mini DV, DV DV or MICRO MV MICROMV.

Connecting with the A/V connecting cable



the i.LINK cable

If your VCR is a monaural type
Connect the yellow plug of the A/V connecting cable to the video input jack and the white or the red plug to the audio input jack on the VCR. When the white plug is connected, the left channel audio is output, and when the red plug is connected, the right channel audio is output.

If your VCR has an S VIDEO jack
See page 45 for details.

About the i.LINK connecting
See page 199 for details.

Pictures processed with picture effect, digital effect or PB ZOOM
These are not output through the i, DV Interface.

If you connect with the i.LINK cable
You cannot record the picture or the sound separately.

Dubbing a tape

When connecting with the A/V connecting cable
- Set DISPLAY in ETC to LCD in the menu settings. (The default setting is LCD.)
- Press the following buttons to make the indicator disappear so that they will not be superimposed on the edited tape:
 On your camcorder:
 DISPLAY/BATT INFO, DATA CODE
 On the Remote Commander:
 DISPLAY, DATA CODE, SEARCH MODE

The POWER switch should be set to VCR.

(1) Insert a blank tape (or a tape you want to record over) into the VCR, and insert the recorded tape into your camcorder.
(2) Prepare the VCR for recording. If your VCR has an input selector, set it to the input mode.
Refer to the operating instructions of the VCR.
(3) Play back the recorded tape on your camcorder.
(4) Start recording on the VCR.
Refer to the operating instructions of your VCR.

When you have finished dubbing the tape
Press ■ on both your camcorder and the VCR.

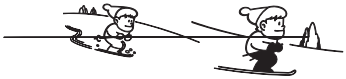
If you record a paused playback picture
- The recorded picture becomes rough with the i, DV Interface.
- The picture may jitter when you play back the picture using other video equipment.

Dubbing only desired scenes – Digital program editing (on a tape)

You can duplicate selected scenes (programs) for editing onto another tape without operating the VCR.
Scenes can be selected by frame. You can set up to 20 programs.
Your camcorder can dub on a "Memory Stick." See page 127 for details.

Unwanted scene

Unwanted scene



Switch the order



Before operating Digital program editing having the tape recorded on other equipment

Step 1 Connecting to the VCR.
Step 2 Setting the VCR for operation (p. 81).
Step 3 Adjusting the synchronization of the VCR (p. 84).

When you dub using the same VCR again, you can skip Step 2 and 3.

Using Digital program editing having the tape recorded on other equipment

Operation 1 Making a program (p. 86).
Operation 2 Performing the program (Dubbing on the tape) (p. 88).

Note

When editing digital video, the operation signals to the VCR cannot be sent with the LANC jack.

Step 1: Connecting to the VCR

You can connect either the A/V connecting cable or the i.LINK cable.
Connect the devices as illustrated on page 78.

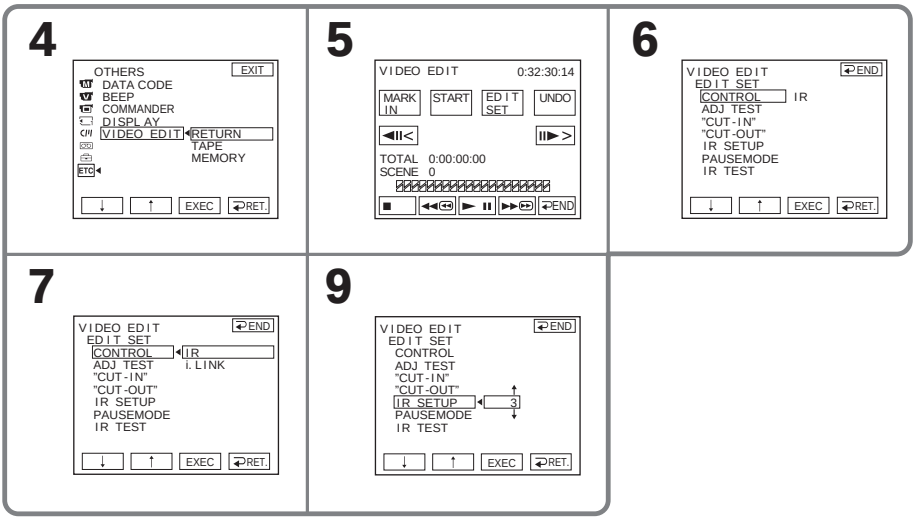
Step 2: Setting the VCR for operation

When connecting with the A/V connecting cable, your camcorder sends the control signal by infrared rays to the remote sensor on the VCR.

The POWER switch should be set to (VCR).

Operate by touching the panel.

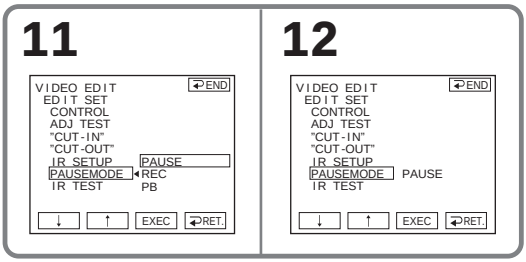
(1) Turn the power of the connected VCR on.
If your VCR has an input selector, set it to the input mode. When you connect a video camera recorder, set its power switch to VCR/VTR.
(2) Press FN to display PAGE1.
(3) Press MENU.
(4) Select VIDEO EDIT in ETC, then press EXEC.
(5) Select TAPE, then press EXEC.
(6) Press EDIT SET.
(7) Select CONTROL, then press EXEC.
(8) When connecting with the A/V connecting cable, select IR, then press EXEC.
When connecting with the i.LINK cable, select i.LINK, press EXEC, then go to "Step 3: Adjusting the synchronization of the VCR" on page 84.
(9) Select IR SETUP, then press EXEC.
(10) Select the IR SETUP code of your VCR, then press EXEC. Check the code in "About the IR SETUP code" (p. 83).



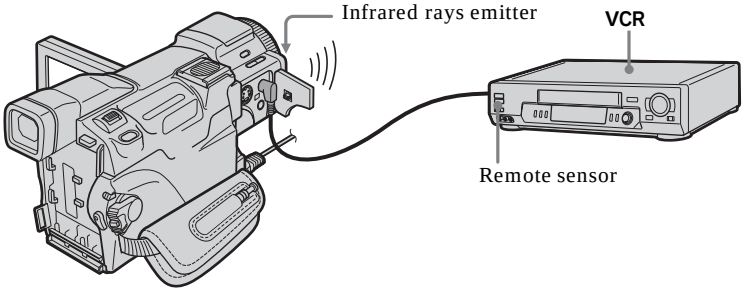
(continued on the following page)

(11) Select PAUSEMODE, then press EXEC.

(12) Select the mode to cancel recording pause on the VCR, then press EXEC.
The correct button depends on your VCR.
Refer to the operating instructions of your VCR.



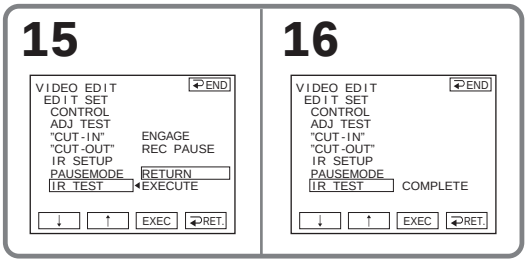
(13) Locate the infrared rays emitter of your camcorder and face it towards the remote sensor of the VCR about 30 cm (12 in.) apart.
Do not put any obstacles between the both equipment.



(14) Insert a recordable tape into the VCR, then set the VCR to recording pause.

(15) Select IR TEST, then press EXEC.

(16) Select EXECUTE, then press EXEC.
If the VCR starts recording, the setting is correct.
The indicator you selected to cancel recording pause on the VCR flashes on the screen. When finished, the indicator changes to COMPLETE.



When the VCR does not operate correctly

- After checking the code in "About the IR SETUP code," set the IR SETUP or the PAUSEMODE again.
- Place your camcorder at least 30 cm (12 in.) away from the VCR.
- Refer to the operating instructions of your VCR.

Note

When you connect with the i.LINK cable, you may not be able to operate the dubbing function correctly, depending on the VCR.
Set CONTROL to IR in the menu settings of your camcorder.

About the IR SETUP code

The IR SETUP code is stored in the memory of your camcorder. Be sure to set the correct code, depending on your VCR. Default setting is code number 3.

Brand	IR SETUP code
Sony	1, 2, 3, 4, 5, 6
Admiral (M. Wards)	89
Aiwa	47, 54, 80
Akai	49, 51
Audio Dynamic	21, 35
Bell&Howell (M. Wards)	36
Broksonic	21, 70, 82
Canon	77, 78
Citizen	47
Craig	47, 73
Curtis Mathis	8, 77, 80
Daewoo	26, 40, 77
DBX	21, 33, 35
Dimensia	8
Emerson	26, 48, 59, 70, 80, 81, 82
Fisher	36, 37, 44, 45
Funai	80
General Electric	8, 32*, 77, 94*, 101
Goldstar / LG	47
GO VIDEO	71
Hitachi	8, 42, 78
HQ	40
Instant Replay	77, 78
JC Penny	8, 21, 33, 35, 36, 42, 77
JVC	12, 13, 14, 21, 33, 35
Kenwood	21, 33, 35, 47
LXI (Sears)	36, 37, 42, 44, 45, 47, 49, 80
Magnavox	17, 77, 78, 83
Marantz	21, 33, 35
Marta	47
Memorex	37, 77
Minolta	8, 42
Mitsubishi / MGA	22, 23, 24, 28, 29
Multitech	23, 32, 80
NEC	21, 33, 35
Olympic	77, 78
Optimus	22
Orion	60
Panasonic	16, 17, 77, 78
Pentax	8, 42
Philco	26, 70, 77, 78
Philips	47, 77, 78, 83
Pioneer	78
Quasar	6, 16, 17, 77, 78
RCA / PROSCAN	7, 8, 16, 40, 41, 42, 77, 78, 78*, 83, 101
Realistic	22, 36, 37, 77, 80, 88
Sansui	21
Singer	73
Samsung	24, 24*, 32, 32*, 41, 94, 94*
Sanyo	26, 36, 37, 47
Scott	22, 23, 24, 28, 32, 37, 40, 41
Sharp	88, 89
Shintom	73
Signature 2000	80, 89
Sylvania	77, 78, 80, 83
Symphonic	80
Tashiro	47
Tatung	21, 33, 35
Teac	21, 33, 35, 80
Technics	77, 78
Toshiba	7, 40, 49
Wards	37, 47, 88, 89, 95
Yamaha	21, 33, 35, 36
Zenith	95

* TV / VCR component

Note on the IR SETUP code

Digital program editing is not possible if the VCR does not support IR SETUP codes.

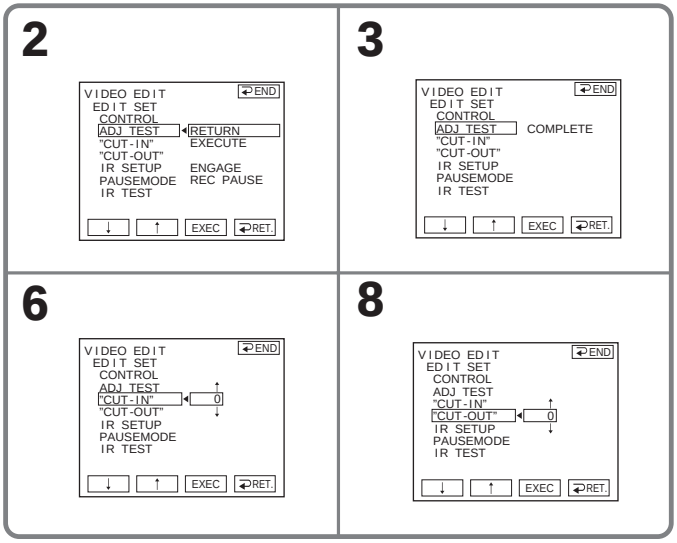
Step 3: Adjusting the synchronization of the VCR

You can adjust the synchronization of your camcorder and the VCR.
Prepare a pen and paper for notes.
Before operation, eject the cassette from your camcorder (if inserted).

The POWER switch should be set to (VCR).

Operate by touching the panel.

(1) Insert a recordable cassette into the VCR, then set the VCR to recording pause.
When you select i.LINK in CONTROL, recording pause is not necessary.
(2) Select ADJ TEST, then press EXEC.
(3) Select EXECUTE, then press EXEC.
IN and OUT are recorded on an image for five times each to calculate the number values for adjusting the synchronization.
The EXECUTING indicator flashes on the screen. When finished, the indicator changes to COMPLETE.
(4) Rewind the tape in the VCR, then start slow playback.
Five opening number of each IN, and closing number of each OUT appear.
Take a note of the opening number value of each IN and the closing number value of each OUT.
(5) Calculate the average of five opening number values of IN, and the average of five closing number values of each OUT.
(6) Select ”CUT-IN”, then press EXEC.
(7) Select the average number value of IN, then press EXEC.
The calculated start position for recording is set.
(8) Select ”CUT-OUT”, then press EXEC.
(9) Select the average number value of OUT, then press EXEC.
The calculated stop position for recording is set.
(10) Press ↩ RET. to execute.



To return to FN

Press ↩ END to return to PAGE1, then press EXIT.

Notes

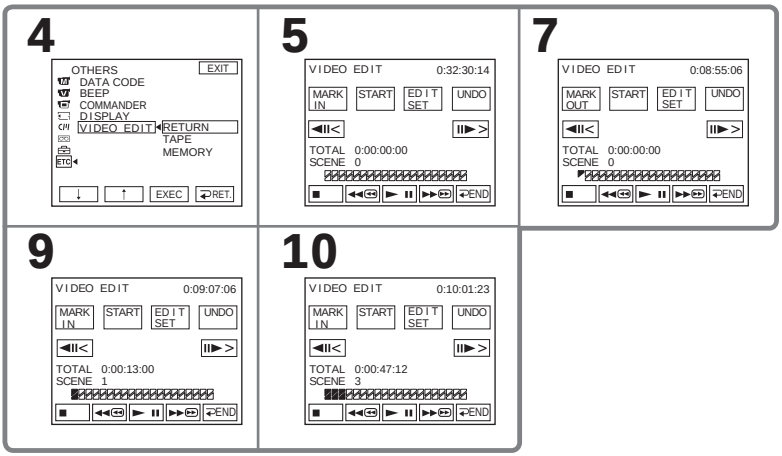
- When you complete “Step 3 : Adjusting the synchronization of the VCR,” the image used to adjust the synchronization is recorded for about 50 seconds.
- If you start recording from the very beginning of the tape, the first few seconds of the tape may not be recorded properly. Be sure to allow about 10 seconds’ lead before starting recording.
- When the recording unit cannot be operated properly with the i.LINK cable, leave the connection as it is, and make the A / V connecting cable settings (p. 81). Video and audio are sent by digital signals.

Operation 1: Making a Program

The POWER switch should be set to (VCR).

Operate by touching the panel.

(1) Insert the cassette for playback into your camcorder, and insert a cassette for recording into the VCR.
(2) Press FN to display PAGE1.
(3) Press MENU.
(4) Select VIDEO EDIT in ETC, then press EXEC.
(5) Select TAPE, then press EXEC.
(6) Search for the beginning of the first scene you want to insert using the video control buttons on the screen, then pause playback. You can fine-adjust one frame at a time with ◄II< / II►>.
(7) Press MARK IN on the screen or MARK on the Remote Commander.
The IN point of the first program is set, and the upper part of the program mark changes to light blue.
(8) Search for the end of the first scene you want to insert using the video control buttons on the screen, then pause playback. You can fine-adjust one frame at a time with ◄II< / II►>.
(9) Press MARK OUT on the screen or MARK on the Remote Commander.
The OUT point of the first program is set, then the lower part of the program mark changes to light blue.
(10) Repeat Step 6 to 9.
You can set up to 20 programs in maximum.



To finish making programs

Press ⮌ END.

The program is stored in memory until the tape is ejected.

Note
87

Operation 2: Performing the program (Dubbing on the tape)

The POWER switch should be set to (VCR).

Operate by touching the panel.

(1) When you use a digital video camera recorder, set its power switch to VCR/VTR.
(2) Make sure your camcorder and the VCR are connected, and that the VCR is set to recording pause.
When you use the i.LINK cable, this procedure is not necessary.
(3) Press FN to display PAGE1.
(4) Press MENU.
(5) Select VIDEO EDIT in ETC, then press EXEC.
(6) Select TAPE, then press EXEC.
(7) Press START.
(8) Press EXEC.
Your camcorder searches for the beginning of the first program, then dubbing starts.
The program mark flashes.
The SEARCH indicator appears during search, and the EDITING indicator appears during edit on the screen.
When dubbing ends, your camcorder and the VCR automatically stop.

To cancel dubbing during edit

Press CANCEL.

To end Digital program editing

Your camcorder stops when dubbing is complete. Then the display returns to VIDEO EDIT in the menu settings.
Press ↩ END to end the video edit function.

When the program has not been set

You cannot press START.

You cannot record on the VCR in the following

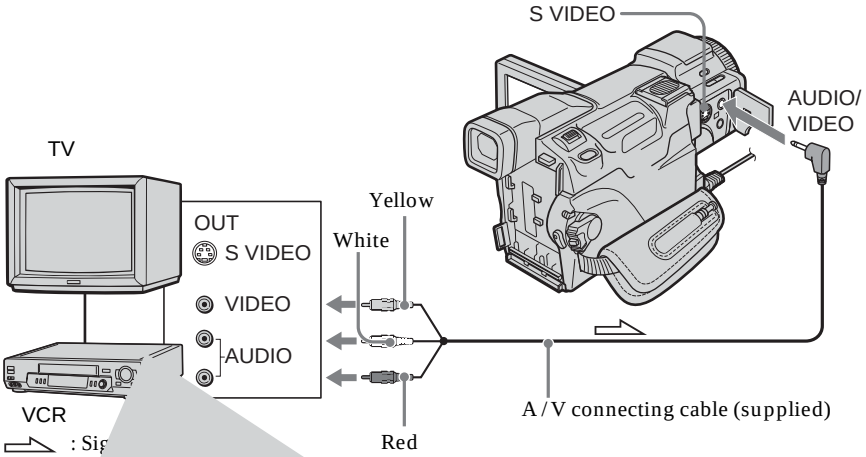
Indicator	Cause
No indicator	• The write-protect tab on the cassette is set to lock. • The IR SETUP code is not correct. (When IR is selected.) • The button to cancel recording pause is not correct. (When IR is selected.)
CHECK ”i.LINK” & REC STATUS	• i.LINK is selected but the i.LINK cable is not connected. • The power of the connected VCR is not turned on. (When i.LINK is selected.)

Recording video or TV programs

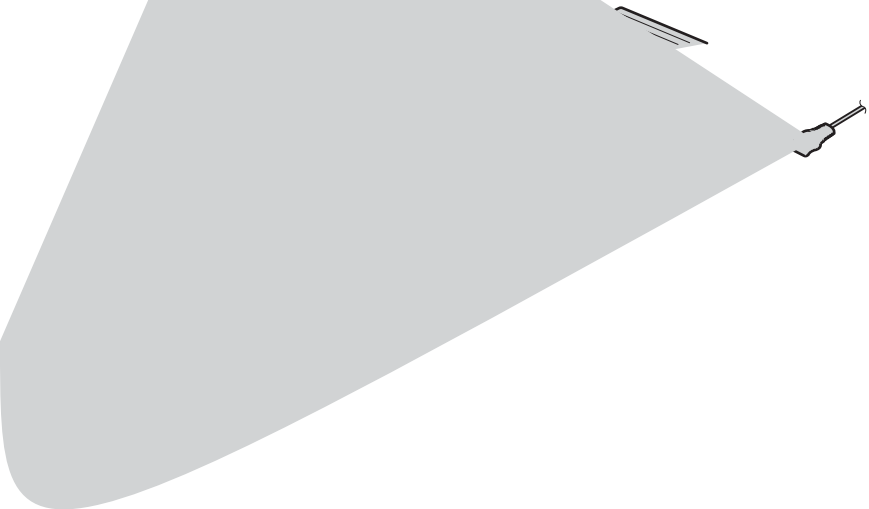
You can record a tape from another VCR or a TV program from a TV that has video/audio outputs. Use your camcorder as a recorder. You can connect either the A/V connecting cable (supplied) or i.LINK cable (optional).
If you connect with the i.LINK cable (optional), video and audio signals are transmitted in digital form for high-quality editing.

Connecting to the VCR or the TV

Connecting with the A/V connecting cable



C LINK cable



If your VCR is a monaural type
Connect the yellow plug of the A/V connecting cable to the video input jack and the white or the red plug to the audio input jack on the VCR or the TV. When the white plug is connected, the left channel audio is output, and when the red plug is connected, the right channel audio is output.

If your VCR has an S video jack
See page 45 for details.

When using the i.LINK cable
- Before recording, make sure if the DV IN indicator appears on the screen. The DV IN indicator may appear on both equipment.
- You cannot record the picture or the sound separately.

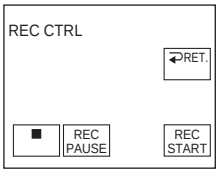
Recording video or TV programs

When connecting with the A/V connecting cable
Set DISPLAY in ETC to LCD in the menu settings. (The default setting is LCD.)

The POWER switch should be set to VCR.
Operate by touching the panel.

(1) Insert a blank tape (or a tape you want to record over) into your camcorder. If you are recording from the tape on the VCR, insert the recorded tape into the VCR.

(2) Set your camcorder to recording pause.
① Press FN and select PAGE3.
② Press REC CTRL.
③ Press REC PAUSE.



(3) Press ► on the VCR to start playback if you record from the tape on the VCR. Select a TV program if you record from a TV. The picture from the playback side appears on the screen.

(4) Press REC START at the scene where you want to start recording from.

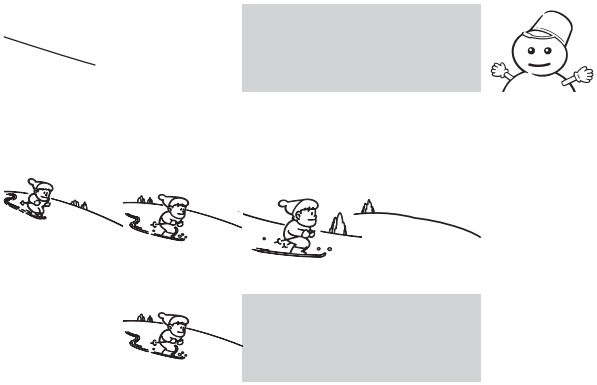
When you have finished dubbing the tape
Press ■ on your camcorder, and then press the stop button on the VCR.

Using the Remote Commander
In Step 2, press ● REC and MARK simultaneously, then immediately press ❚❚. In Step 4, press ❚❚ at the scene where you want to start recording from.

Note on the Remote Commander
Your camcorder works in the commander mode VTR 2. Commander modes 1, 2 and 3 are used to distinguish your camcorder from other Sony VCRs to avoid erroneous remote control operation. If you use another Sony VCR in the commander mode VTR 2, we recommend changing the commander mode or covering the sensor of the VCR with black paper.

Inserting a scene from a VCR – Insert editing

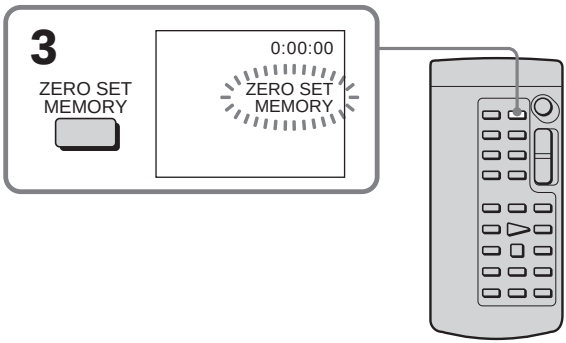
You can insert a new scene with sound from a VCR onto your originally recorded tape by specifying the insert start and end points. Use the Remote Commander for this operation.
Connections are the same as on page 89. Insert the cassette containing the desired scene to insert into the VCR.



[A] The tape that contains the scene to be inserted
[B] The tape before editing
[C] The tape after editing

The POWER switch should be set to (VCR).
Operate by touching the panel.

(1) On the VCR, locate just before the insert start point **[a]**, then set the VCR to playback pause.
(2) On your camcorder, locate the insert end point **[c]**, then set it to playback pause.
(3) Press ZERO SET MEMORY on the Remote Commander. The ZERO SET MEMORY indicator flashes and the end point of the insert is stored in memory. The tape counter shows “0:00:00”.
(4) On your camcorder, locate the insert start point **[b]** and set your camcorder to recording pause.
① Press FN and select PAGE3.
② Press REC CTRL.
③ Press REC PAUSE.
(5) First press ❚❚ on the VCR, and after a few seconds press REC START on your camcorder to start inserting the new scene with sound.
Inserting automatically stops near the zero point on the tape counter. Your camcorder automatically stops recording and the zero point set with ZERO SET MEMORY is cleared from memory.



To change the insert end point

Press ZERO SET MEMORY on the Remote Commander again after Step 4 to erase the ZERO SET MEMORY indicator and begin from Step 2.

Using the Remote Commander

In Step 4, press ● REC and MARK simultaneously, then immediately press ❚❚. In Step 5, press ❚❚ at the scene where you want to start recording from.

To insert a scene without setting the insert end point

Skip Step 2 and 3. Press ■ on the Remote Commander or ■ on your camcorder when you want to stop inserting.

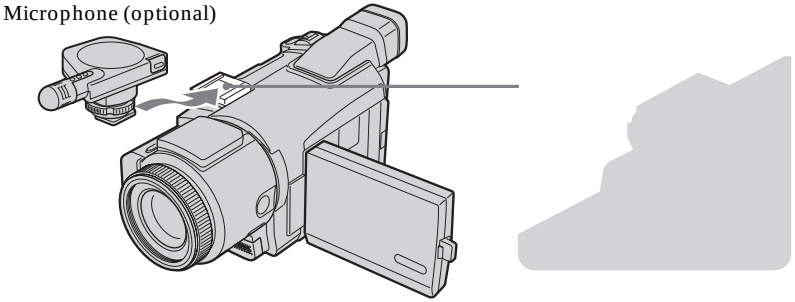
You can record additional audio to the original sound on the tape by connecting audio equipment or a microphone. If you connect the audio equipment, you can add sound to your tape already recorded in the 12-bit mode by specifying start and end points. The original sound will not be erased.

You cannot dub audio in the following cases:

- The tape recorded in the 16-bit mode
- The tape recorded in the LP mode
- Connecting with the •

Connecting the microphone (optional) to the intelligent accessory shoe

Slide the shoe cover to remove it. Then, connect the external microphone (optional) to the intelligent accessory shoe.



Connecting the A/V connecting cable to the AUDIO/VIDEO jack

Note

When dubbing with the AUDIO / VIDEO jack or the built-in microphone, pictures are not output through the S VIDEO jack or AUDIO / VIDEO jack. Check the recorded picture on the screen. You can check the recorded sound by using headphones.

Adding audio on the recorded tape

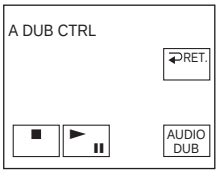
Choose a connection mentioned on pages 93, 94, and connect the audio equipment or the microphone to your camcorder. Then follow the procedure below using the touch panel or the Remote Commander supplied with your camcorder.

Using the touch panel

The POWER switch should be set to (VCR).

Operate by touching the panel.

(1) Insert the recorded tape into your camcorder.
(2) Locate the recording start point. Press ►II to start playing back. To pause playing back, press ►II at the recording start point. You can fine adjust the recording start point by pressing I◄◄ / ►►I on the Remote Commander.
(3) Press FN and select PAGE3.
(4) Press A DUB CTRL.
The A DUB CTRL screen appears.

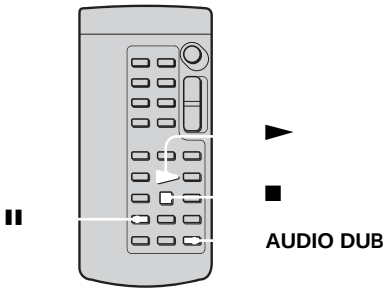


(5) Press AUDIO DUB. The green ⊖II indicator appears on the screen.
(6) Press ►II on your camcorder and at the same time start playing back the audio you want to record.
The new sound is recorded in stereo 2 (ST2) during playback. While recording new sound, the red ⊖ indicator appears on the screen.
(7) Press ■ on your camcorder at the point where you want to stop recording.

Using the Remote commander

The POWER switch should be set to (VCR).

(1) Follow Step 1 and 2 in “Using the touch panel.”
(2) Press AUDIO DUB on the Remote Commander.
The green ⊖II indicator appears on the screen.
(3) Press II on the Remote Commander and at the same time start playing back the audio you want to record.
The new sound is recorded in stereo 2 (ST2) during playback. While recording new sound, the red ⊖ indicator appears on the screen.
(4) Press ■ on the Remote Commander at the point where you want to stop recording.



To add new sound more precisely

Press ZERO SET MEMORY at the point where you want to stop recording later during playback.

Follow Step 2 in “Using the touch panel” on page 95. Recording automatically stops at the point where ZERO SET MEMORY was pressed.

We recommend that you add new sound on the tape recorded with your camcorder

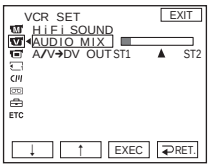
If you add new sound on the tape recorded with another camcorder (including another DCR-TRV60/TRV70), the sound quality may become worse.

Monitoring the new recorded sound

The POWER switch should be set to VCR.

Operate by touching the panel.

(1) Play back the tape on which you added audio.
(2) Press FN to display PAGE1.
(3) Press MENU.
(4) Select AUDIO MIX in , then press EXEC.



(5) Press ↓/↑ to adjust the balance between the original sound (ST1) and the new sound (ST2), then press EXEC.

About five minutes after you disconnect the power source or remove the battery pack, the setting of AUDIO MIX returns to the original sound (ST1) only. The default setting is original sound only.

Superimposing a title on a cassette with Cassette Memory

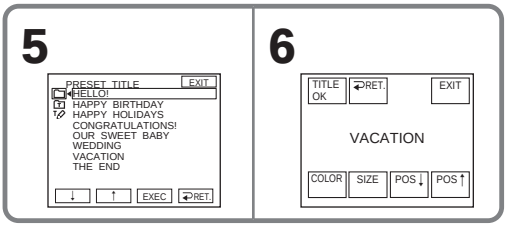


One cassette can have up to about 20 titles, with each title comprising five characters. However, if Cassette Memory is full with date and cassette label data, one cassette can have only up to about 11 titles each comprising five characters.
Cassette Memory capacity is as follows:
– Six date data (maximum)
– One cassette label (maximum)

The POWER switch should be set to CAMERA or VCR.

Operate by touching the panel.

(1) Insert a cassette with Cassette Memory.
(2) During standby, recording, playback or playback pause, press FN to display PAGE1.
(3) Press MENU.
(4) Select TITLE in [CHI], then press EXEC.
(5) Select [🗀], then press EXEC.
(6) Select a desired title, then press EXEC. The title appears on the screen.
(7) If necessary, change the color, size, or position by pressing COLOR, SIZE, POS ↓ or POS ↑.
(8) Press TITLE OK.
(9) Press SAVE TITLE.
During playback, playback pause or recording:
The TITLE SAVE indicator is displayed on the screen for about five seconds and the title is set.
During recording standby:
The TITLE indicator appears. And when you press START/STOP to start recording, the TITLE SAVE indicator is displayed on the screen for about five seconds and the title is set.



To use the custom title
If you want to use the custom title, select [🗀] in Step 5.

The titles superimposed with your camcorder

- They are displayed only by the DV Mini DV format video equipment with the index titler function.
- The point you superimposed the title may be detected as an index signal when searching a recording with another video equipment.

To not display title

Set TITLE DSPL in [CII] to OFF in the menu settings (p. 178).

Title setting

- The title color changes as follows:

 WHITE → YELLOW → VIOLET → RED → CYAN → GREEN → BLUE

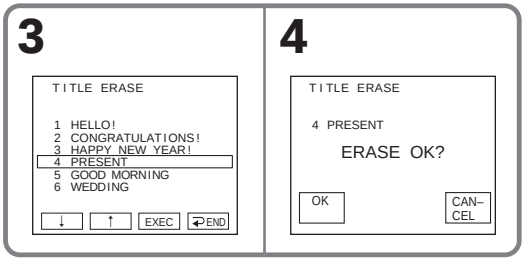
- The title size changes as follows:
 SMALL ↔ LARGE
 You cannot input 13 characters or more in LARGE size.
- The title position changes as follows:
 If you select the title size SMALL, you have nine choices for the title position.
 If you select the title size LARGE, you have eight choices for the title position.

Erasing a title

The POWER switch should be set to (CAMERA) or (VCR).

Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select TITLEERASE in [CII], then press EXEC. The TITLE ERASE screen appears.
(4) Select the title you want to erase, then press EXEC.
The ERASE OK? indicator appears.
(5) Make sure the title is the one you want to erase, then press OK.
The ERASING indicator flashes on the screen.
When the title is erased, the COMPLETE indicator appears.



To return to FN

Press EXIT.

To cancel erasing

Press CANCEL in Step 5.

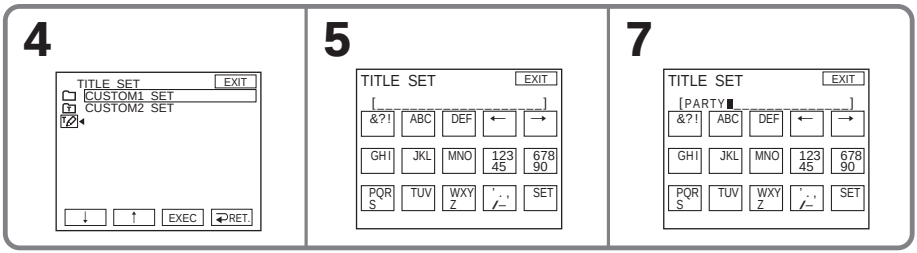
Making your own titles

You can make up to two titles and store them in the memory of your camcorder. Each title can have up to 20 characters.

The POWER switch should be set to (CAMERA) or (VCR).

Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select TITLE in [CHI], then press EXEC.
(4) Select [T], then press EXEC.
(5) Select CUSTOM1 SET or CUSTOM2 SET, then press EXEC.
(6) Select a desired character. Repeat pressing a key to select a desired character on the key.
(7) Press → to move ▮ for the next character. Repeat the same procedure as Step 6 and 7 to complete your title.
(8) Press SET. The title is stored in memory.



To return to FN

Press EXIT.

To change a title you have stored

In Step 5, select CUSTOM1 SET or CUSTOM2 SET, depending on which title you want to change, then press EXEC and enter a new title as desired.

If you take five minutes or longer to enter characters during tape recording standby with the cassette inserted in your camcorder

The power automatically goes off. The characters you have entered remain stored in memory. Set the POWER switch to OFF (CHG) once and then to CAMERA again, then start again from Step 1.

We recommend setting the POWER switch to VCR or removing the cassette so that your camcorder does not automatically turn off while you are entering title characters.

To erase the character

Press ←. The last character is erased.

To enter a space

Press →.

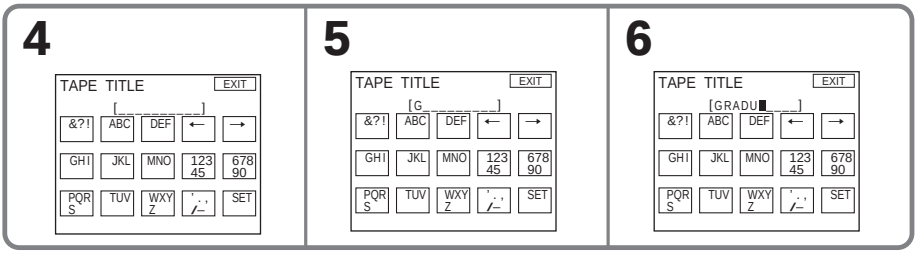
Labeling a cassette with Cassette Memory

The label can consist of up to 10 characters and is stored in Cassette Memory. When you insert the labeled cassette and set the POWER switch to CAMERA or VCR, the label is displayed for about five seconds.

The POWER switch should be set to CAMERA or VCR.

Operate by touching the panel.

(1) Insert a cassette with Cassette Memory you want to label.
(2) Press FN to display PAGE1.
(3) Press MENU.
(4) Select TAPE TITLE in CI, then press EXEC.
(5) Select a desired character. Repeat pressing a key to select a desired character on the key.
(6) Press → to move ▮ for the next character. Repeat the same procedure as Step 5 and 6 to complete the label.
(7) Press SET. The label is stored in memory.



To return to FN

Press EXIT.

To erase the label you have made

Select ← in Step 5 to erase the label, then press SET.

To change the label you have made

Insert the cassette for which you want to change the label, and operate in the same way to make a new label.

If you have superimposed titles in the cassette

When the label appears, up to four titles also appear.

To erase the character

Press ←. The last character is erased.

To enter a space

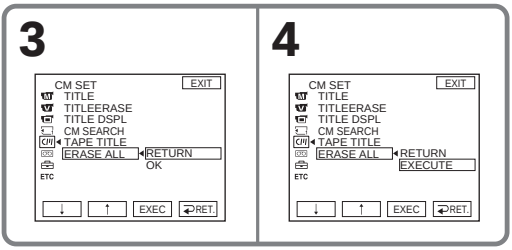
Press →.

Erasing all the data in Cassette Memory

The following data saved in Cassette Memory can be completely erased at once:
– Date data
– Title data
– Cassette label

The POWER switch should be set to CAMERA or VCR.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select ERASE ALL in CM, then press EXEC.
(4) Select OK, then press EXEC.
The OK indicator changes to EXECUTE.
(5) Select EXECUTE, then press EXEC. The ERASING indicator flashes on the screen. When erasing is complete, the COMPLETE indicator appears.



To return to FN

Press EXIT.

To cancel erasing

Select RETURN in Step 5, then press EXEC.

The “Memory Stick” is a new light and small recording media which, despite of the size, can store greater data than a floppy disk.
In addition to exchanging data between “Memory Stick” compatible equipment, you can also use a “Memory Stick” to store data as a type of detachable external recording media.

Image data may be damaged in the following cases. We cannot compensate for the damaged image data.

– If you eject the "Memory Stick," turn the power off on your camcorder or remove the battery pack for replacement while your camcorder is reading or writing image files on the "Memory Stick" (while the access lamp is lit or flashing).
– If you use the "Memory Stick" near magnets or magnetic fields such as those of speakers and a TV.

We recommend backing up important data on the hard disk of a computer.

On handling

- When you carry or store the "Memory Stick," put it in its case.
- Prevent metallic objects or your finger from coming into contact with the metal parts of the connecting section.
- Do not bend, drop or apply strong shock to the "Memory Stick."
- Do not disassemble or modify the "Memory Stick."
- Do not let the "Memory Stick" get wet.

On location for use

Do not use or keep the "Memory Stick" in locations that are:
– Extremely hot such as in a car parked in the sun or under the scorching sun
– Under direct sunlight
– Very humid or subject to corrosive gases

Notes on using the "Memory Stick Duo" (optional)

- Be sure to insert the "Memory Stick Duo" into the "Memory Stick Duo" Adaptor when using the "Memory Stick Duo" with your camcorder.
- Make sure you insert the "Memory Stick Duo" in the proper direction. Inserting it the wrong way may cause a malfunction.
- Do not insert the "Memory Stick Duo" not inserted into the "Memory Stick Duo" Adapter into the "Memory Stick"-compatible unit. This may cause a malfunction of the unit.

Note on using the "Memory Stick PRO" (optional)

The "Memory Stick PRO" with a capacity up to 1 GB can be used with this camcorder.

The "Memory Stick" formatted by a computer

The "Memory Stick" formatted by Windows OS or Macintosh computers do not have a guaranteed compatibility with your camcorder.

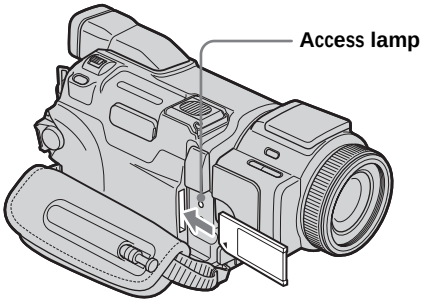
Notes on image data compatibility

- Image data files recorded on the "Memory Stick" by your camcorder conform with the Design Rule for Camera File Systems universal standard established by the JEITA (Japan Electronics and Information Technology Industries Association).
 On your camcorder, you cannot play back still images recorded on other equipment (DCR-TRV890E / TRV900 / TRV900E or DSC-D700 / D770) that does not conform to this universal standard. (These models are not sold in some areas.)
- If you cannot use the "Memory Stick" that is used with other equipment, format it with your camcorder (p. 177). Note that formatting erases all information on the "Memory Stick."
- You may not be able to play back images recorded on your camcorder depending on the equipment you attempt to use for playback.
- You may not be able to play back images with your camcorder:
 – When playing back image data modified on your computer.
 – When playing back image data shot with other equipment.

- The "Memory Stick", MEMORY STICK and "MagicGate Memory Stick" are trademarks of Sony Corporation.
- "Memory Stick Duo" and MEMORY STICK DUO are trademarks of Sony Corporation.
- "Memory Stick PRO" and MEMORY STICK PRO are trademarks of Sony Corporation.
- "MagicGate" and MAGICGATE are trademarks of Sony Corporation.
- All other product names mentioned herein may be the trademarks or registered trademarks of their respective companies.
 Furthermore, "™" and "®" are not mentioned in each case in this manual.

Inserting a "Memory Stick"

Insert a "Memory Stick" in the "Memory Stick" slot as far as it can go with the ◀ mark facing out as illustrated.



Ejecting a "Memory Stick"

Press a "Memory Stick" once lightly.

Notes

- If you insert a "Memory Stick" forcibly in the opposite direction, the "Memory Stick" slot may be damaged.
- Do not insert anything other than a "Memory Stick" into the "Memory Stick" slot. This may cause a malfunction.

While the access lamp is lit or flashing

Do not shake or knock your camcorder because your camcorder is reading the data from the "Memory Stick" or writing the data on the "Memory Stick." Do not turn the power off, eject the "Memory Stick" or remove the battery pack. Otherwise, image data may become damaged.

If "MEMORY STICK ERROR" appears

Reinsert the "Memory Stick" a few times. The "Memory Stick" may be damaged if the indicator still appears. If this occurs, use another "Memory Stick."

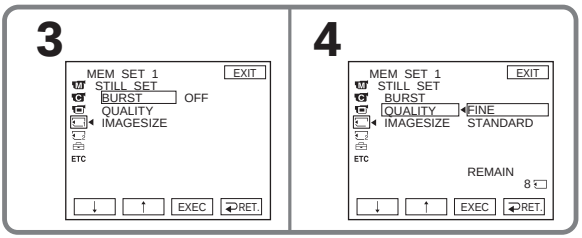
Selecting the quality and size of image data

Selecting the still image quality

The default setting is FINE.

The POWER switch should be set to (MEMORY) or (VCR).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select STILL SET in , then press EXEC.
(4) Select QUALITY, then press EXEC.
(5) Select a desired image quality, then press EXEC.



Setting	Meaning
FINE (FINE)	Use this mode when you want to record high quality images. Fine images are compressed to about 1/4.
STANDARD (STD)	This is the standard image quality. Standard images are compressed to about 1/10.

To return to FN

Press EXIT.

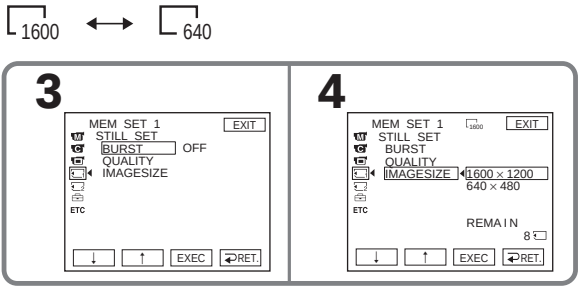
Selecting the still image size

You can select image size 1600 × 1200 or 640 × 480. (When the POWER switch is set to CAMERA or VCR, the image size is automatically set to 640 × 480.)
The default setting is 1600 × 1200.

The POWER switch should be set to (MEMORY).

Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select STILL SET in 🖵, then press EXEC.
(4) Select IMAGESIZE, then press EXEC.
(5) Select a desired image size, then press EXEC.
The indicator changes as follow:



Memory capacity of still images

Recorded images are compressed in the JPEG format before being stored in memory. The memory capacity allotted to each still image varies depending on the selected image quality and image size. Details are shown in the table below.

1600 × 1200 image size

Image quality	Memory capacity
FINE	About 960 KB
STANDARD	About 420 KB

640 × 480 image size

Image quality	Memory capacity
FINE	About 150 KB
STANDARD	About 60 KB

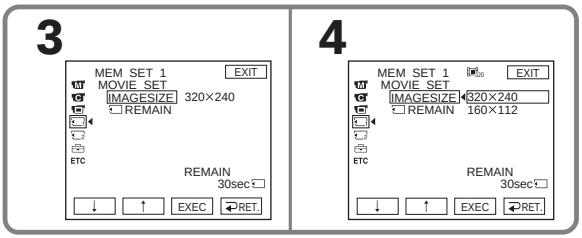
Selecting the moving picture size

You can select picture size 320 × 240 or 160 × 112.
The default setting is 320 × 240.

The POWER switch should be set to (MEMORY) or (VCR).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select MOVIE SET in , then press EXEC.
(4) Select IMAGESIZE, then press EXEC.
(5) Select a desired image size, then press EXEC.
The indicator changes as follows:

320 ⟷ 160



Approximate number of still images and time of moving pictures you can record on a "Memory Stick"

The number of still images and time of moving pictures you can record vary depending on which image quality and image size you select and the complexity of the subject.

Still images

(Unit: Image)

Type of the "Memory Stick"	FINE		STANDARD	
	1600 × 1200 (1600)	640 × 480 (640)	1600 × 1200 (1600)	640 × 480 (640)
8 MB (supplied)	8	50	18	120
16 MB	16	96	37	240
32 MB	32	190	75	485
64 MB	65	390	150	980
128 MB	130	780	300	1970
256 MB (MSX-256)	235	1400	540	3550
512 MB (MSX-512)	480	2850	1100	7200
1 GB (MSX-1G)	980	5900	2250	14500

Moving pictures

Type of the "Memory Stick"	Image size	
	320 × 240 (320)	160 × 112 (160)
8 MB (supplied)	1 min 20 s	5 min 20 s
16 MB	2 min 40 s	10 min 40 s
32 MB	5 min 20 s	21 min 20 s
64 MB	10 min 40 s	42 min 40 s
128 MB	21 min 20 s	1 h 25 min 20 s
256 MB (MSX-256)	42 min 40 s	2 h 50 min 40 s
512 MB (MSX-512)	1 h 25 min 20 s	5 h 41 min 20 s
1 GB (MSX-1G)	2 h 50 min 40 s	11 h 22 min 40 s

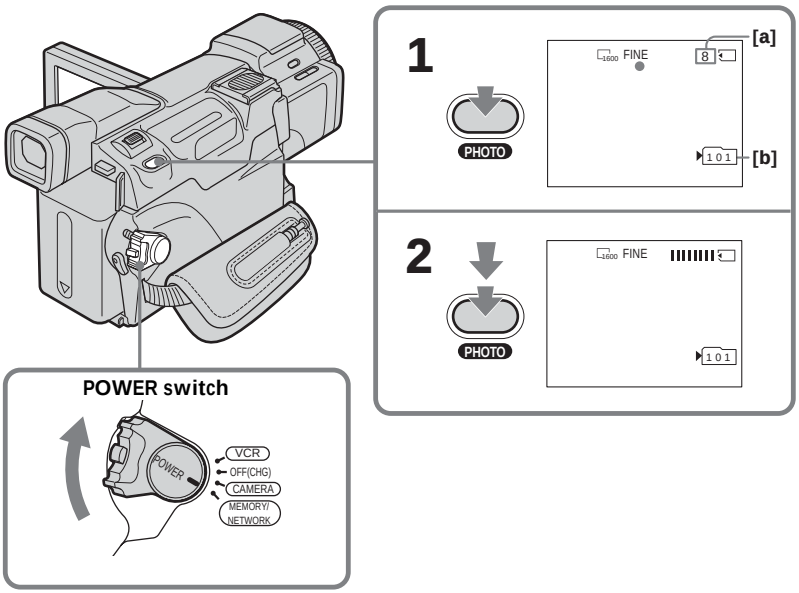
The table shows approximate number of still images and time of moving pictures you can record on a "Memory Stick" formatted with your camcorder.

Recording still images on a “Memory Stick” – Memory Photo recording

The POWER switch should be set to MEMORY.

(1) Keep pressing PHOTO lightly and check the image. The green ● indicator stops flashing, then lights up. The brightness of the image and the focus are adjusted, being targeted for the middle of the image, and are fixed. Recording does not start yet.

(2) Press PHOTO deeply.
Recording is complete when the bar scroll indicator disappears.
The image displayed on the screen when you press PHOTO deeply is recorded on the “Memory Stick.”



[a] Approximate number of images that can be recorded on the “Memory Stick” *
[b] Number of the folder currently used for recording

*** The indication of the number of recordable still images**

Depending on the image quality setting and the complexity of the subject, the indication of the remaining number of recordable still images may not change even after you record an image.
When the remaining number is greater than 9999, the >9999 indicator appears on the screen.

You can record still images on a "Memory Stick" during tape recording or tape recording standby
See page 46 for details.

When the POWER switch is set to MEMORY
The following functions do not work:
– Digital zoom
– Super NightShot
– Color Slow Shutter
– Wide mode
– Fader
– Picture effect
– Digital effect
– SPORTS of PROGRAM AE (The indicator flashes.)
– Title
– SteadyShot

While saving a still image data
You cannot turn off the power or press PHOTO.

When you press PHOTO on the Remote Commander
Your camcorder immediately records the image that is on the screen when you press the button.

When you press PHOTO lightly in Step 1
The image momentarily flickers. This is not a malfunction.

Recording data
The recording data (date/time or various settings when recorded) is not displayed during recording. However, it is recorded automatically onto the "Memory Stick." To display the recording data, press DATA CODE during playback. You can also use the Remote Commander for this operation (p. 40).

If you record still images when the POWER switch is set to MEMORY
The angle of view is slightly larger compared with the angle of view when the POWER switch is set to CAMERA.

Recording images continuously

You can record still images continuously. Before recording, select one of the three modes described below in the menu settings.

NORMAL [a] ()
Your camcorder shoots up to four still images in 1600 × 1200 size or 25 still images in 640 × 480 size at about 0.5 sec intervals.

HIGH SPEED [a] ()
Your camcorder shoots up to 32 still images in 640 × 480 size at about 0.07 sec intervals.

EXP BRKTG [b] (BRK)
Your camcorder automatically shoots three images at about 0.5 sec intervals at different exposures.

[a]

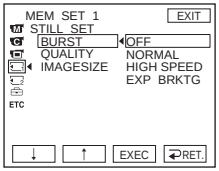


[b]



The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select STILL SET in , then press EXEC.
(4) Select BURST, then press EXEC.



(5) Select a desired mode, then press EXEC.
(6) Press EXIT to make the menu display disappear.
(7) Press PHOTO deeply.

The number of still images in continuous shooting
The number of still images you can shoot continuously varies depending on the image size and the capacity of the "Memory Stick."

While recording images continuously
The flash does not work.

When shooting with the self-timer or the Remote Commander
Your camcorder automatically records up to the maximum number of still images.

When HIGH SPEED is selected
Flickering or changes in color may occur.

If remaining capacity on the "Memory Stick" is less than for three images
EXP BRKTG does not work. "FULL" appears when you press PHOTO.

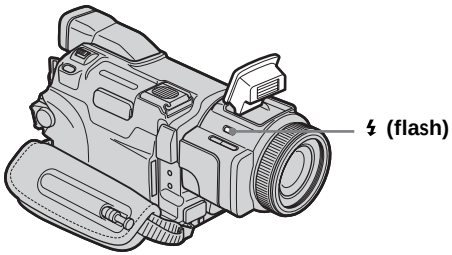
The effect of EXP BRKTG
The effect of EXP BRKTG may not be noticeable on the screen.
We recommend viewing images on the TV or the computer to check the effect.

When NORMAL or HIGH SPEED is selected
Recording continues up to the maximum number of still images while pressing PHOTO deeply.

Recording images with the flash

The POWER switch should be set to MEMORY or CAMERA.

If you press PHOTO, the flash automatically pops up to strobe. The default setting is auto (no indicator). To change the flash mode, press ϟ (flash) repeatedly until the flash mode indicator appears on the screen. You cannot use this function while recording moving pictures.



Each press of ϟ (flash) changes the indicator as follows:

→ ϟ → ⊛ → AUTO (No indicator) ┐

When you set RED EYE R in M to ON in the menu settings, the indicator changes as follows:

→ ◉ → ◉ ϟ → ⊛ ┐

ϟ	Forced flash:	The flash fires regardless of the surrounding brightness.
◉	Auto red-eye reduction:	The flash fires before recording to reduce the red-eye.
◉ ϟ	Forced red-eye reduction:	The flash fires before recording to reduce the red-eye regardless of the surrounding brightness.
⊛	No flash:	The flash does not fire.

The flash is automatically adjusted to the appropriate brightness. You can also change FLASH LVL in M to the desired brightness in the menu settings. Try recording various images to find the most appropriate setting for FLASH LVL.

Notes

- Remove dirt from the surface of the flash if it is dirty. If the surface of the flash is shaded or caked with dirt heated by strobing, the flash may not be able to give off a sufficient amount of light.
- The recommended shooting distance using the built-in flash is 0.3 m to 2.5 m (31/32 feet to 8 1/3 feet).
- Attaching the lens hood (supplied) or a conversion lens (optional) may cause their shadow to appear.
- You cannot use an external flash (optional) and the built-in flash at the same time.
- Auto red-eye reduction () and Forced red-eye reduction () may not produce the desired effect depending on individual differences, the distance to the subject, the subject not looking at the pre-recording flash or other conditions.
- The flash effect cannot be obtained easily when you use forced flash in a bright location.
- When recording with the flash, it takes longer to prepare for the next shooting. This is because your camcorder starts to charge power for firing after the flash pops up.
- The flash charge lamp flashes while the power for firing is being charged. After charging is completed, the flash charge lamp lights up.
- If it is not easy to focus on a subject automatically, for example, when recording in the dark, use HOLOGRAM AF (p. 115) or the focal distance information (p. 63) for focusing manually.
- When the flash pops up, it may be up against the accessory attached to the intelligent accessory shoe depending on the accessory used together. In this case, set the built-in flash to (No flash). When you are using the external flash, the built-in flash will not pop up.

The flash does not fire even if you select auto and (auto red-eye reduction) during the following operations:

– NightShot
– SPOTLIGHT of PROGRAM AE
– SUNSETMOON of PROGRAM AE
– LANDSCAPE of PROGRAM AE
– Manual exposure
– Flexible Spot Meter

While recording images continuously

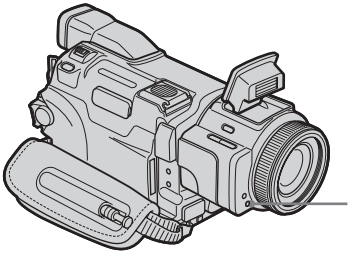
The flash does not work.

Shooting with an auxiliary light – HOLOGRAM AF

The HOLOGRAM AF is an auxiliary light source used for focusing on subjects in dark places.

The POWER switch should be set to (MEMORY).

Set HOLOGRAM F in C to AUTO in the menu settings. (The default setting is AUTO.) When ON appears on the screen in a dark place, press PHOTO lightly. Then the HOLOGRAM AF emitter automatically emits auxiliary light until the subject is focused.



About HOLOGRAM AF

"HOLOGRAM AF (Auto-Focus)," an application of laser holograms, is an AF optical system that enables still image shooting in dark places. Having gentler radiation than conventional high-brightness LEDs or lamps, the system satisfies Laser Class 1 (*) specification and thus maintains higher safety for human eyes.
No safety problems will be caused by directly looking into the HOLOGRAM AF emitter at a close range. However, it is not recommended to do so, because you may experience such effects like several minutes of image residual and dazzling, that you encounter after looking into a flashlight.

* HOLOGRAM AF satisfies Class 1(time base 30,000 seconds), specified in all of JIS (Japan), IEC(EU), and FDA(US) industry standards.
Complying with these standards ensures that the laser product is safe, under a condition that a human looks at the laser light either directly or even through a lens for 30,000 seconds.

Notes

- Attaching a conversion lens (optional) may obstruct the HOLOGRAM AF light and make focusing difficult.
- If enough light does not reach the subject even if the HOLOGRAM AF emitter emits light (recommended shooting distance is up to 2.5 m (8 1/3 feet)), the subject will not be focused.

The HOLOGRAM AF does not emit light in the following cases:

– When the POWER switch is set to CAMERA.
– NightShot
– Flash is set to ⚡ (no flash).
– SUNSETMOON of PROGRAM AE
– LANDSCAPE of PROGRAM AE
– Manual focus
– Spot Focus
– Continuous photo recording

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Recording a still image from other equipment

You can use either the A/V connecting cable or the i.LINK cable. Connect the equipment as illustrated on page 89.
When connecting with the A/V connecting cable, set DISPLAY in ETC to LCD in the menu settings. (The default setting is LCD.)

The POWER switch should be set to VCR.

(1) Play back the recorded tape on the VCR, or turn the TV on to see a desired program.
The image from the other equipment is displayed on the screen.
(2) At the point where you want to record, follow Step 2 and 3 on page 116.

Note

Images may not be imported properly or distorted images may be recorded when you record from the tape repeatedly used for dubbing and the recording state is poor.

Superimposing a still image in the “Memory Stick” on an image – MEMORY MIX

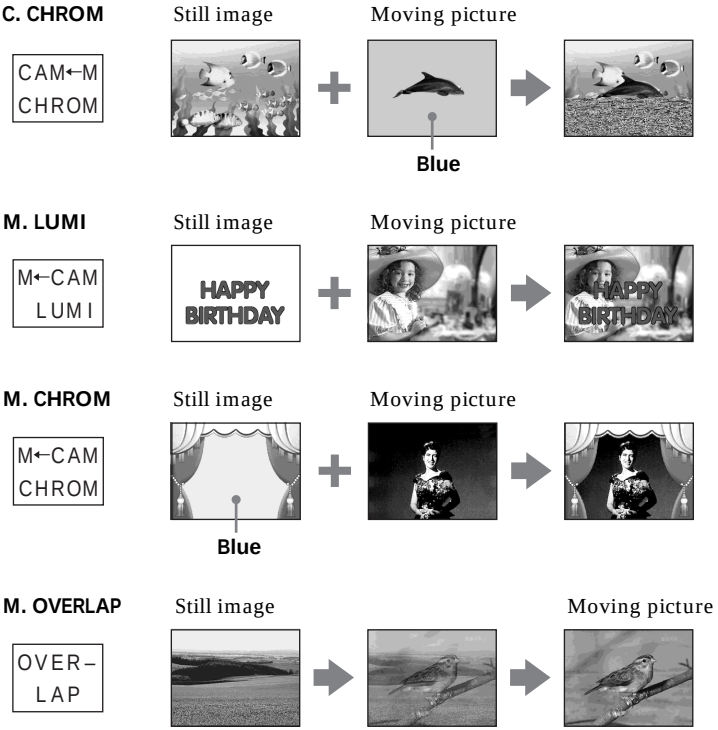
You can superimpose a still image you have recorded on the “Memory Stick” on top of the moving picture you are recording. **You cannot superimpose a still image on the tape on which you have already finished recording.** You can record the superimposed images on a tape or a “Memory Stick.” However, you can record only superimposed still images on a “Memory Stick.”

C. CHROM (Camera Chroma key)
You can superimpose a moving picture on top of a still image such as an image which can be used as background. Shoot the subject against a blue background. Only the blue area of the moving picture will be swapped with a still image.

M. LUMI (Memory Luminance key)
You can swap the brighter area of a still image (such as a handwritten illustration or a title) with a moving picture. To use this function, we recommend recording a title on the “Memory Stick” before a trip or event.

M. CHROM (Memory Chroma key)
You can swap only the blue area of a still image such as an illustration or a frame with a moving picture.

M. OVERLAP (Memory Overlap)
You can make a moving picture you are recording with your camcorder fade in on top of a still image recorded on the “Memory Stick.” You can use M.OVERLAP only when the POWER switch is set to CAMERA.



Notes

- You cannot use MEMORY MIX for moving pictures recorded on a “Memory Stick.”
- When the overlapping still image has a large amount of white, the thumbnail image of the picture may not be clear.
- When you use MEMORY MIX in the mirror mode (p. 29), the picture on the LCD screen appears normally without being mirror-reversed.

Image data modified with your computer

You may not be able to play back the images modified with your computer on your camcorder.

The “Memory Stick” supplied with your camcorder stores 20 images:

– For M. CHROM: 18 images (such as a frame) 101-0001~101-0018
– For C. CHROM: two images (such as a background) 101-0019~101-0020

Sample images

Sample images stored in the “Memory Stick” supplied with your camcorder are protected (p. 137).

Recording a superimposed image on a tape

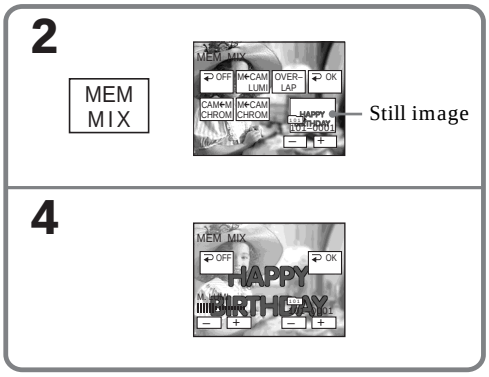
Before operation

- Insert the “Memory Stick” containing still images into your camcorder.
- Insert a tape for recording into your camcorder.

The POWER switch should be set to CAMERA.

Operate by touching the panel.

(1) Press FN and select PAGE2.
(2) Press MEM MIX. The image recorded on the “Memory Stick” appears on the right lower part of the screen.
(3) Press – (to see the previous image) / + (to see the next image) on the right lower corner of the screen to select the still image that you want to superimpose.
(4) Press a desired mode. The still image is superimposed on the moving picture during recording standby.



(continued on the following page)

(5) Press –/+ on the left lower corner of the screen to adjust the effect, then press ⮐ OK to return to PAGE2.

C. CHROM – The color (blue) scheme of the area in the moving image which is to be swapped with a still picture
M. LUMI – The color (bright) scheme of the area in the still image which is to be swapped with a moving picture
M. CHROM – The color (blue) scheme of the area in the still image which is to be swapped with a moving picture
M. OVERLAP – No adjustment necessary
You can use M.OVERLAP only when the POWER switch is set to CAMERA.

(6) Press EXIT to return to FN.
(7) Press START/STOP to start recording.

To change the still image to be superimposed

Press –/+ on the right lower corner before Step 5.

To cancel MEMORY MIX

Press ⮐ OFF to return to PAGE2.

Note

In Step 4, you cannot reselect the mode. Press ⮐ OFF to return to PAGE2.

When you select M. OVERLAP

You cannot change the still image or the mode.

During recording

You cannot change the mode.

To record still images as-is to the tape

Press –/+ on the left lower corner of the screen in the M. LUMI mode and keep going until the bar display on the right is full.

Recording a superimposed image on a "Memory Stick" as a still image

Before operation

Insert the "Memory Stick" containing still images into your camcorder.
Image size of still images is automatically set to 640 × 480.

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

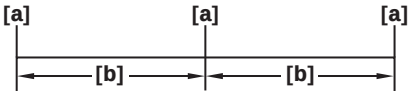
(1) Follow Step 1 to 6 on pages 119, 120.
(2) Press PHOTO deeply to start recording.
Recording is complete when the bar scroll indicator disappears. The image displayed on the screen when you press PHOTO deeply is recorded on the "Memory Stick."

To cancel MEMORY MIX

Press ⮐ OFF to return to PAGE2.

Interval Photo Recording

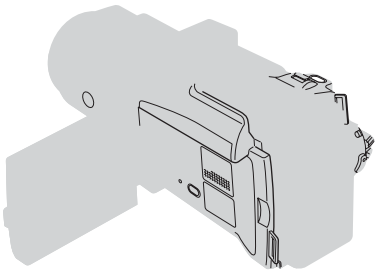
You can make a time-lapse recording by setting the camcorder to automatically record still images.



[a] Memory Photo recording
[b] INTERVAL

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select INT. R-STL in 2, then press EXEC.
(4) Select SET, then press EXEC.
(5) Select INTERVAL, then press EXEC.
(6) Select a desired interval time, then press EXEC.
(7) Press ↩ RET.
(8) Set INT.R-STL to ON, then press EXEC.
(9) Press EXIT to return to FN.
The INTERVAL MEM STILL indicator flashes on the screen.
(10) Press PHOTO deeply.
Interval Photo Recording starts.
The INTERVAL MEM STILL indicator lights up on the screen during Interval Photo Recording.



To cancel Interval Photo Recording

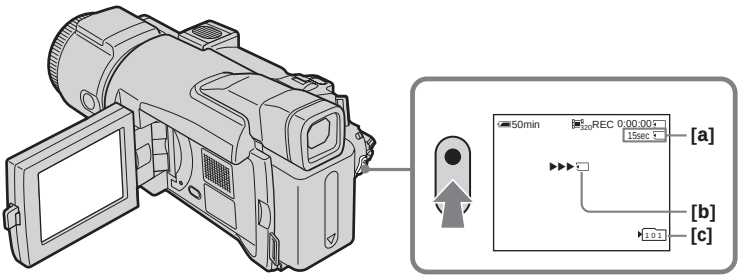
Set INT. R-STL to OFF.

Recording moving pictures on a “Memory Stick” – MPEG MOVIE recording

You can record moving pictures with sound on a “Memory Stick” (MPEG MOVIE EX).

The POWER switch should be set to (MEMORY).

Press START/STOP.
Your camcorder starts recording. The camera recording lamp located on the front of your camcorder lights up.
The picture and sound are recorded up to the remaining capacity of the “Memory Stick.” For details on recording time, see page 108.



[a] Available recording time on the “Memory Stick”
[b] This indicator is displayed for about five seconds after pressing START/STOP. This indicator is not recorded.
[c] Number of the folder currently used for recording

To stop recording

Press START/STOP.

Note

Sound is recorded in monaural.

When the POWER switch is set to MEMORY

The following functions do not work:
– Digital zoom
– Super NightShot
– Color Slow Shutter
– Wide mode
– Fader
– Picture effect
– Digital effect
– SPORTS of PROGRAM AE (The indicator flashes.)
– Title
– SteadyShot

When using an external flash (optional)

Turn the power of the external flash off when recording moving pictures on the "Memory Stick." Otherwise, the charging sound of the flash may be recorded.

Recording date/time

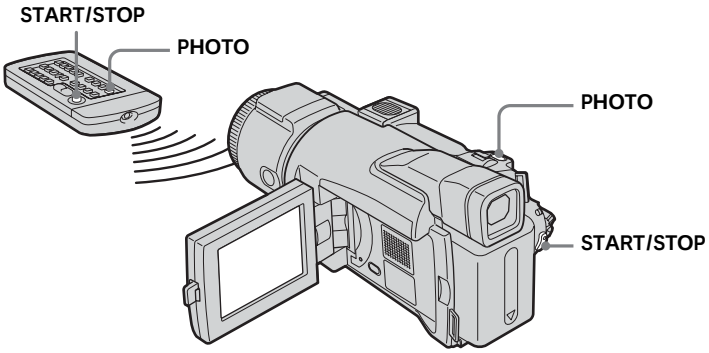
The date/time is not displayed during recording. However, it is automatically recorded onto the "Memory Stick." To display the recording date/time, press DATA CODE during playback. Various settings cannot be recorded (p. 40).

Self-timer recording

You can record moving pictures on the "Memory Stick" with the self-timer. See page 124 for details.

Self-timer recording

You can record still images and moving pictures on a “Memory Stick” with the self-timer. You can also use the Remote Commander for this operation.



Recording a still image

The POWER switch should be set to (MEMORY).

Operate by touching the panel.

(1) Press FN and select PAGE2.
(2) Press SELFTIMER.
The (self-timer) indicator appears on the screen.
(3) Press EXIT to return to FN.
(4) Press PHOTO deeply.
The self-timer starts counting down from about 10 with a beep. In the last two seconds of the countdown, the beep gets faster, then recording starts automatically.

Recording a moving picture

The POWER switch should be set to (MEMORY).

Operate by touching the panel.

(1) Follow Step 1 and 3 in “Recording a still image.”
(2) Press START/STOP.
The self-timer starts counting down from about 10 with a beep. In the last two seconds of the countdown, the beep gets faster, then recording starts automatically.

To stop the countdown while recording a moving picture

Press START/STOP. To restart the countdown, press START/STOP again.

To cancel the self-timer

With your camcorder in standby, press SELFTIMER and the (self-timer) indicator disappears from the screen. You cannot cancel the self-timer using the Remote Commander.

When self-timer recording is finished

The self-timer is automatically canceled.

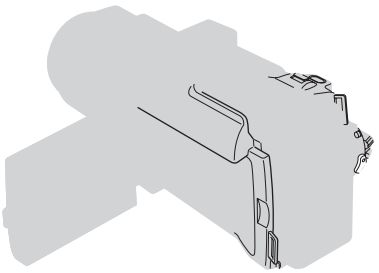
Recording a picture from a tape as a moving picture

Your camcorder can read moving picture data recorded on a tape and record it as a moving picture on a "Memory Stick."

Before operation
Insert the recorded tape and a "Memory Stick" into your camcorder.

The POWER switch should be set to (VCR).
Operate by touching the panel.

(1) Press ▶II. The picture recorded on the tape is played back.
(2) Press ▶II again to pause playback at the scene where you want to start recording from.
(3) Press START/STOP. Images and sound are recorded on the "Memory Stick." For details on recording time, see page 108.



[a] Available recording time on the "Memory Stick"
[b] This indicator is displayed for about five seconds after pressing START/STOP. This indicator is not recorded.
[c] Number of the folder currently used for recording

To stop recording

Press START/STOP.

Notes

- Sound recorded in 48 kHz is converted to 32 kHz sound when recording images from a tape to a "Memory Stick."
- Sound recorded in stereo is converted to monaural sound when recording from a tape.

Titles recorded on the tape
You cannot record the titles.

If the "⚠ AUDIO ERROR" indicator appears
Sound that cannot be recorded by your camcorder has been recorded. Connect the A/V connecting cable to input images from the external equipment used to play back the image (p. 89).

Data Codes recorded on the tape
Data Codes recorded on the tape cannot be recorded on the "Memory Stick."
The date/time when it is recorded on the "Memory Stick" is recorded. Various settings are not recorded.

Recording a moving picture from other equipment

You can use either the A/V connecting cable or i.LINK cable.
Connect the equipment as illustrated on page 89.
When connecting with the A/V connecting cable, set DISPLAY in ETC to LCD in the menu settings. (The default setting is LCD.)

The POWER switch should be set to VCR.

(1) Play back the recorded tape on the VCR, or turn the TV on to see a desired program.
The image from the other equipment is displayed on the LCD screen or in the viewfinder.
(2) Press START/STOP at the scene where you want to start recording from.

Note

Recording may abort unexpectedly or distorted images may be recorded in the following cases:
– When there is a blank portion on the tape.
– When recording from the tape repeatedly used for dubbing and the recording state is poor.
– When the input signal is cut off.

Recording edited pictures from a tape as a moving picture – Digital program editing (on a "Memory Stick")

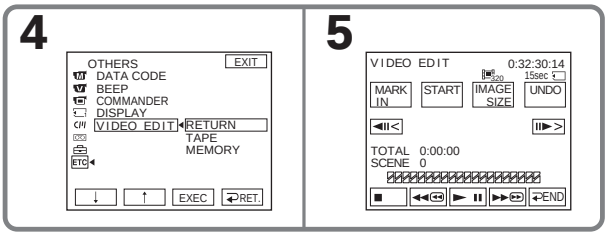
You can duplicate selected scenes (programs) for editing onto a "Memory Stick."

Making a program

The POWER switch should be set to (VCR).

Operate by touching the panel.

(1) Insert the tape for playback, and a "Memory Stick" for recording into your camcorder.
(2) Press FN to display PAGE1.
(3) Press MENU.
(4) Select VIDEO EDIT in ETC, then press EXEC.
(5) Select MEMORY, then press EXEC.
(6) Repeat pressing IMAGESIZE to select a desired size. The image size changes each time you press IMAGESIZE.
(7) Follow Step 6 to 10 on page 86.



To finish making a program

Press ↩ END.

The program is stored in memory until the tape is ejected.

Notes

- You cannot dub the titles, display indicators or the contents of Cassette Memory.
- You cannot operate recording during Digital program editing on the "Memory Stick."

On a blank portion of the tape

You cannot set IN or OUT.

If there is a blank portion between the IN point and the OUT point on the tape

The total time may not be displayed correctly.

While making a program

If you eject the cassette, the NOT READY indicator appears on the screen. The program will be erased.

Erasing the program you have set

See "Erasing the program you have set" on page 87.

Erasing all programs

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select VIDEO EDIT in ETC, then press EXEC.
(4) Select MEMORY, then press EXEC.
(5) Follow Step 2 to 4 on page 87.

Performing the program (Dubbing on a "Memory Stick")

The POWER switch should be set to (VCR).

Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select VIDEO EDIT in ETC, then press EXEC.
(4) Select MEMORY, then press EXEC.
(5) Press START.
(6) Press EXEC.

Your camcorder searches for the beginning of the first program, then starts dubbing.
The program mark flashes.
The SEARCH indicator appears during search, the EDITING indicator appears while storing data in your camcorder, and the REC indicator appears on the screen during dubbing on the "Memory Stick."
When dubbing ends, your camcorder automatically stops.

To stop dubbing

Press CANCEL.
The program you have made is recorded on the "Memory Stick" up to the point where you press CANCEL.

To end Digital program editing

Your camcorder stops when dubbing ends. Then the display returns to VIDEO EDIT in the menu settings.
Press ⮐ END to end Digital program editing function.

Note

Recording may abort unexpectedly or distorted images may be recorded in the following cases:
– When there is a blank portion on the tape.
– When recording from the tape repeatedly used for dubbing and the recording state is poor.

The NOT READY indicator appears on the screen when:

– The program to operate Digital program editing has not been made.
– The "Memory Stick" is not inserted.
– The write-protect tab on the "Memory Stick" is set to LOCK.

When the available recording time of the "Memory Stick" is not enough

The LOW MEMORY indicator appears on the screen. However, you can record pictures up to the time indicated.

When the program has not been set

You cannot press START.

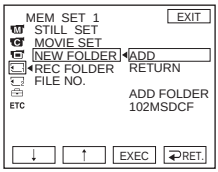
Changing the recording folder

You can create multiple folders up to “999MSDCF” in a “Memory Stick.”
When you have recorded a lot of image files on the “Memory Stick,” you can assort the files using multiple folders for your convenience.
The “101MSDCF” folder is set for the recording folder as the default setting.

Creating a new folder

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select NEW FOLDER in , then press EXEC.



(4) Select ADD, then press EXEC. A new folder is created. The maximum number+1 is assigned for the newly created folder. A newly created folder is automatically set for the recording folder.

To return to FN

Press EXIT.

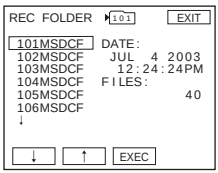
To cancel creating a new folder

Select RETURN in Step 4, then press EXEC.

Choosing the recording folder

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select REC FOLDER in , then press EXEC.



(4) Press ↓ (to move to the next folder) / ↑ (to move to the previous folder) to select a folder you want to use for recording, then press EXEC.

To return to FN

Press EXIT.

Notes

- Up to 9999 image files can be recorded in each folder. When a folder is full, a new folder is automatically created.
- Once a folder is created, it cannot be deleted with your camcorder.
- The more folders you have created, the less the remaining capacity of the “Memory Stick” becomes.

You can view the still images recorded on the “Memory Stick.” And furthermore, you can play back six images including moving pictures at a time arranged in the order of recording on the “Memory Stick” by selecting the index screen. You can also use the Remote Commander for this operation.

The POWER switch should be set to (MEMORY).

Operate by touching the panel.

(1) Press PLAY. The last recorded image is displayed.
(2) Press – (to see the previous image) / + (to see the next image) on your camcorder to select a desired still image.

To cancel Memory Photo playback

Press CAM.

When no file is in the folder

The “NO FILE AVAILABLE” indicator appears.

Screen indicators during still image playback

To make screen indicators disappear, press DISPLAY / BATT INFO.

Recording data

To display the recording data (date / time or various settings when recorded), press DATA CODE during playback. You can also use the Remote Commander for this operation (p. 40).

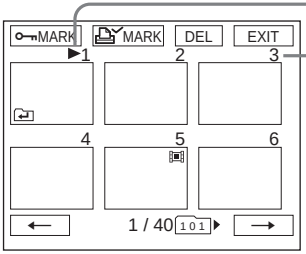
Notes on the data file number

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Playing back six recorded images at a time (index screen)

This function is especially useful when searching for a particular image.

Press INDEX to display the index screen.
A red ▶ mark appears above the image that appeared on the full screen before changing to the index screen mode.



←: To display the previous six images
→: To display the next six images

To return to FN

Press EXIT.

To return to the normal playback screen (single screen)

Press the image you want to display.

Viewing a moving picture – MPEG MOVIE playback

You can view moving pictures recorded on the “Memory Stick.”

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press PLAY. The last recorded image appears.
(2) Press – (to see the previous picture) / + (to see the next picture) to select a desired moving picture.
(3) Press MPEG ► II to start playback.
(4) Adjust the volume following the steps below.
① Press FN and select PAGE3.
② Press VOL. The screen to adjust the volume appears.
③ Press – (to turn down the volume) / + (to turn up the volume) to adjust the volume.
④ Press ↩ OK to return to PAGE3.
⑤ Press EXIT to return to FN.

To cancel MPEG MOVIE playback

Press MPEG ► II.

When no file is in the folder

The “NO FILE AVAILABLE” indicator appears.

Playing back a moving picture from a desired part

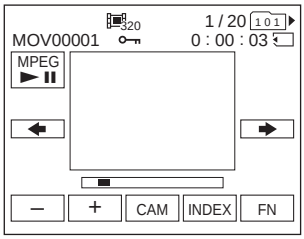
The moving picture recorded on the "Memory Stick" is divided into multiple parts. You can select one of them and start playing back the picture from the scene you want to see. The moving picture is divided into up to 60 parts. The number of divided parts differs depending on recording time. When the recording time is extremely short, the moving picture is not divided.

The POWER switch should be set to (MEMORY).

Operate by touching the panel.

(1) Follow Step 1 and 2 on page 132.

(2) Press ⬅ (to see the previous part)/➡ (to see the next part) to select the part you want to play back.



(3) Follow Step 3 and 4 on page 132.

To cancel MPEG MOVIE playback

Press MPEG ► II.

Screen indicators during moving picture playback

To make screen indicators appear or disappear, press DISPLAY/BATT INFO.

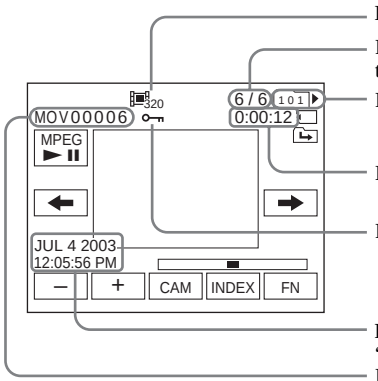


Image size

Picture number/Total number of recorded pictures in the current playback folder

Playback folder

Memory playback time

Protect

Recording date/time (Various settings appear as "– – –".)

Data file number

Recording date/time

To display the recording date/time, press DATA CODE during playback. You can also use the Remote Commander for this operation (p. 40).

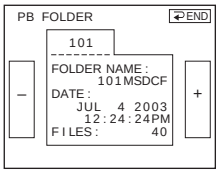
Choosing the playback folder

You can change the folder currently chosen for playback. The currently chosen folder is displayed in the upper right on the screen.

The POWER switch should be set to (MEMORY).

Operate by touching the panel.

(1) Press FN to display to PAGE1.
(2) Press PB FOLDR.
(3) Press –/+ to select the folder number you want to choose for playback, then press ⮌ END to return to PAGE1.



– : To select the previous folder
+ : To select the next folder

(4) Press EXIT. The images in the playback folder are played back.

Note

Your camcorder does not recognize folder names created or changed on the computer.

Current playback folder

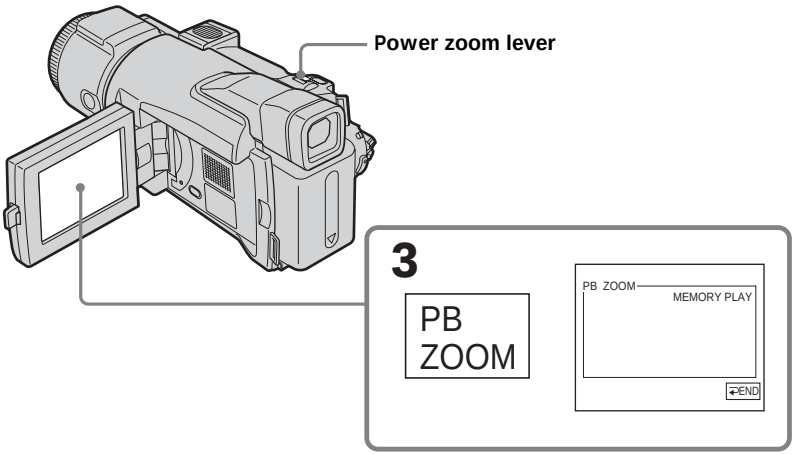
The current playback folder is valid until the next recording is made. Once you record an image, the current recording folder becomes the current playback folder.

Enlarging still images recorded on a "Memory Stick" – Memory PB ZOOM

You can enlarge still images on the screen and view a desired part of them.

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Play back the image to enlarge in the frame.
(2) Press FN and select PAGE2.
(3) Press PB ZOOM. The PB ZOOM screen appears.
(4) Press the area you want to enlarge in the frame.
The area you have pressed moves to the center of the screen, and the playback image is enlarged to approximately at twice the size. If you press another area again, the area moves to the center of the screen.
(5) Adjust the zoom ratio by the power zoom lever.
You can select the image from approximately 1.1 times up to five times its size.
W: To decrease the zoom ratio
T: To increase the zoom ratio



To cancel memory PB ZOOM

Press ↩ END.

Memory PB ZOOM is canceled when you press the following buttons on the Remote Commander:
– MEMORY PLAY
– MEMORY INDEX
– MEMORY +/–

In memory PB ZOOM
If you press DISPLAY/BATT INFO, the frame on the memory PB ZOOM screen disappears. You cannot move the part you have pressed to the center of the screen.

Edge of the image
The edge of the image cannot be displayed at the center of the screen.

Moving pictures recorded on the "Memory Stick"
Memory PB ZOOM does not work.

To record images processed with memory PB ZOOM on the "Memory Stick"
Press PHOTO to record images during display. The image size is 640 × 480.

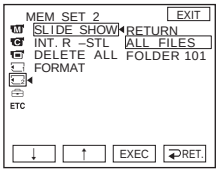
Playing back images continuously – Slide show

You can play back all the images in the “Memory Stick” or in the specified folder using Slide show.

The POWER switch should be set to (MEMORY).

Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select SLIDE SHOW in 2, then press EXEC.



(4) Select ALL FILES or FOLDER □□□ *, then press EXEC.
ALL FILES : To play back all the images in the “Memory Stick”
FOLDER □□□ *: To play back all the images in the folder selected with PB FOLDER
* The folder number is displayed in the □□□.
(5) Press START. Your camcorder plays back the images recorded on the “Memory Stick” in sequence. When all the images have been played back, slide show automatically stops and the first image is displayed on the screen.

To cancel slide show

Press ↩ END.

To pause slide show

Press PAUSE.

To return to FN

Press ↩ END to return to PAGE1, then press EXIT.

To start slide show from a particular image

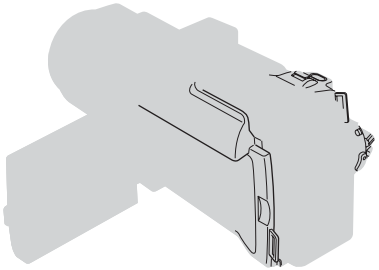
Select a desired image using –/+ buttons before Step 5.

Preventing accidental erasure – Image protection

To prevent accidental erasure of important images, you can protect selected images.

The POWER switch should be set to MEMORY.
Operate by touching the panel.

(1) Press INDEX.
(2) Press MARK. The screen to protect the image appears.
(3) Press the image you want to protect. A indicator appears above the protected image.



To return to FN

Press EXIT.

To cancel image protection

Press the image you want to cancel image protection in Step 3 again.
The indicator disappears from the image.

Note

Formatting erases all information on the "Memory Stick," including the protected image data. Check the contents of the "Memory Stick" before formatting.

If the write-protect tab on the "Memory Stick" is set to LOCK

You cannot set or cancel protection on images.

Deleting images – DELETE

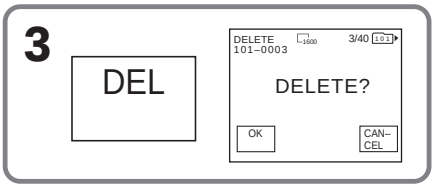
You can delete all the images or selected images.

Deleting selected images

The POWER switch should be set to (MEMORY).

Operate by touching the panel.

(1) Play back the image you want to delete.
(2) Press FN to display PAGE1.
(3) Press DEL. The DELETE? indicator appears on the screen.
(4) Press OK. The selected image is deleted.



To return to FN

Press EXIT.

To cancel deleting an image

Press CANCEL in Step 4.

Notes

- To delete a protected image, first cancel image protection.
- Once you delete an image, you cannot restore it. Check the images to delete carefully before deleting them.

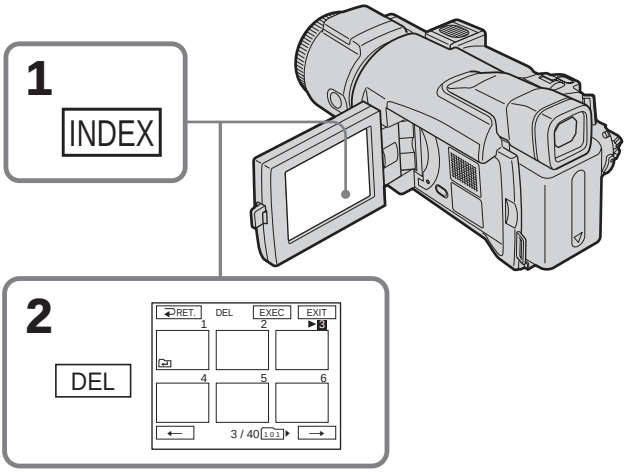
If the write-protect tab on the "Memory Stick" is set to LOCK

You cannot delete images.

Deleting selected images on the index screen

The POWER switch should be set to (MEMORY).
Operate by touching the panel.

(1) Press INDEX.
(2) Press DEL. Then press the image you want to delete. The number of the selected image is highlighted.
You can specify and delete up to a hundred image files at once.
(3) Press EXEC. The DELETE? indicator appears on the screen.
(4) Press OK. The selected images are deleted.



To return to FN

Press EXIT.

To cancel deleting an image

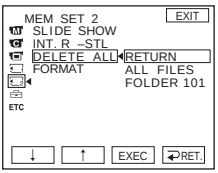
Press CANCEL in Step 4.

Deleting all the images

You can delete all the unprotected images in the “Memory Stick.”

The POWER switch should be set to MEMORY.
Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select DELETE ALL in 2, then press EXEC.



(4) Select ALL FILES or FOLDER □□□ *, then press EXEC.
ALL FILES: To delete all the images in the “Memory Stick”
FOLDER □□□ *: To delete all the images in the folder selected with PB FOLDER
* The folder number is displayed in the □□□.
(5) Select OK, then press EXEC.
OK changes to EXECUTE.
(6) Select EXECUTE, then press EXEC.
The DELETING indicator appears, then flashes on the screen.
When all the unprotected images are deleted, the COMPLETE indicator appears.

To return to FN

Press EXIT.

To cancel deleting all the images in the “Memory Stick”

Select RETURN in Step 5 or 6, then press EXEC.

While the DELETING indicator appears
Do not turn the POWER switch to other positions or press any buttons.

Even if you delete all the images
You cannot delete the folders.

Changing the image size – Resize

You can change the size of recorded still images to 640 × 480 or 320 × 240. Use this function when you reduce the size of the image file to attach it to an e-mail. The original image is retained even after resizing.

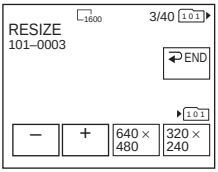
The POWER switch should be set to (MEMORY).

Operate by touching the panel.

(1) During memory playback, press FN and select PAGE2.

(2) Press RESIZE.

The RESIZE screen appears.



(3) Press 640 × 480 or 320 × 240.

The image is recorded as the most recent file in the currently chosen recording folder.

To change still images

Press –/+ before Step 3.

To return to FN

Press ↩ END to return to PAGE2, then press EXIT.

Notes

- You cannot resize the picture recorded with MPEG MOVIE recording.
- You may not be able to resize image files recorded on other equipment.
- When resizing the image file, you cannot specify FINE or STANDARD for it.

Memory capacity of still images after resizing

Image size	Memory capacity
640 × 480	About 150 KB
320 × 240	About 16 KB

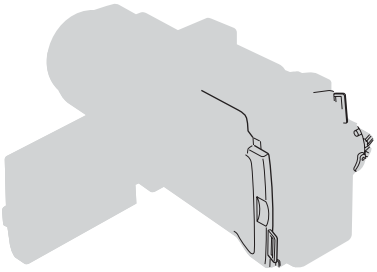
Writing a print mark – Print mark

This function is useful for printing out still images later.
(You cannot specify the number for printouts.)
Your camcorder conforms with the DPOF (Digital Print Order Format) standard for specifying still images to print out.

The POWER switch should be set to (MEMORY).

Operate by touching the panel.

(1) Press INDEX.
(2) Press MARK. The screen to write a print mark appears.
(3) Press the image for which you want to write a print mark. A appears above the selected image.



To return to FN

Press EXIT.

To cancel writing print marks

Press the image for which you want to cancel the print mark in Step 3 again. The disappears from the image.

If the write-protect tab on the "Memory Stick" is set to LOCK

You cannot write or cancel print marks on still images.

Moving pictures

You cannot write print marks on moving pictures.

Viewing images with a computer – Introduction

There are following ways of connecting your camcorder to a computer in order to view images saved on the “Memory Stick” or recorded on the tape on a computer.

To view images on a computer which has a “Memory Stick” slot, first eject the “Memory Stick” from your camcorder and then insert it into your computer’s “Memory Stick” slot.

	Camcorder connection jack	Connection cable	Computer environment requirements	Reference pages	
				For Windows Users	For Macintosh Users
Tape image / live from your camcorder	USB jack	USB cable (supplied)	USB port, editing software	146 – 148 150 – 151 156 – 162	–
	DV Interface	i.LINK cable (optional)	DV port, editing software	144	–
“Memory Stick” image	USB jack	USB cable (supplied)	USB port, editing software	146 – 150 152 163 – 165	166 – 168

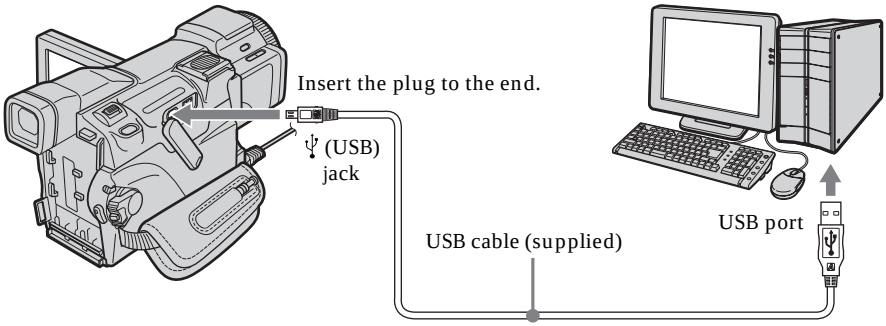
When connecting to a computer with the USB port, complete installation of the USB driver before connecting your camcorder to the computer. If you connect your camcorder to the computer first, you will not be able to install the USB driver correctly.

For details about the computer’s ports and editing software, contact the computer manufacturer.

Viewing pictures recorded on the tape

When connecting to a computer with the USB port

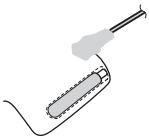
See page 146 for details.



When connecting to a computer with the DV port

The computer must have a DV port and editing software installed that can process video signals.





Viewing images recorded on the "Memory Stick"

When connecting to a computer with the USB port

See page 147 when using Windows and page 166 when using Macintosh.

You can also use a "Memory Stick" Reader / Writer (optional).

When connecting to a computer without a USB port

Use an optional floppy disk adaptor for "Memory Stick" or a PC card adaptor for "Memory Stick."

When purchasing an accessory, check its catalog beforehand for the recommended operating environment.

Notes on using your computer

"Memory Stick"

- "Memory Stick" operations on your camcorder cannot be assured if a "Memory Stick" formatted on your computer is used on your camcorder, or if the "Memory Stick" in your camcorder was formatted from your computer when the USB cable was connected.
- Do not compress the data on the "Memory Stick." Compressed files cannot be played back on your camcorder.

Software

- Depending on your application software, the file size may increase when you open a still image file.
- When you load an image modified using retouching software from your computer to your camcorder or when you directly modify the image on your camcorder, the image format may be different and a file error indicator may appear and you may be unable to open the file.

Communications with your computer

Communications between your camcorder and your computer may not recover even after your computer recovers from Suspend status by its Suspend/Resume function or from Sleep status.

Connecting your camcorder to a computer using the USB cable (For Windows users)

Complete installation of the USB driver before connecting your camcorder to a computer. If you connect your camcorder to a computer first, you will not be able to install the USB driver correctly.

When connecting to a computer with the USB port

You must **install a USB driver** onto the computer in order to connect your camcorder to the computer's USB port. The USB driver can be found on the CD-ROM supplied, along with the application software required for viewing images.
If you connect your camcorder and your computer using the USB cable, you can view pictures live from your camcorder and pictures recorded on the tape on a computer (USB Streaming function).
Furthermore, if you download pictures from your camcorder to a computer, you can process or edit them in image processing software and attach them to e-mail.
You can view images recorded on the "Memory Stick" on a computer.

Recommended computer usage environment when connecting with the USB cable and viewing tape pictures on a computer

OS:
Microsoft Windows 98SE, Windows Me, Windows 2000 Professional, Windows XP Home Edition or Windows XP Professional
Standard installation is required.
However, operation is not assured if the above environment is an upgraded OS.
You cannot hear sound if your computer is running Windows 98, but you can read still images.
CPU:
Minimum 500 MHz Intel Pentium III or faster (800 MHz or faster recommended)
Application:
DirectX 8.0a or later
Sound system:
16 bit stereo sound card and stereo speakers
Memory:
64 MB or more
Hard disk:
Available memory required for installation:
at least 250 MB
Available hard disk memory recommended:
at least 1 GB (depending on the size of the image files edited)
Display:
4 MB VRAM video card, Minimum 800 × 600 dot High color (16 bit color, 65,000 colors), Direct Draw display driver capability (At 800 × 600 dot or less, 256 colors and less, this product will not operate correctly.)
Others:
This product is based on DirectX technology, so it is necessary to install DirectX.
To create a Video CD, a CD-R drive is needed.

The USB port must be provided as standard.

You cannot use this function in the Macintosh environment.

Recommended computer usage environment when connecting with USB cable and viewing the "Memory Stick" images on a computer

Recommended Windows environment

OS:

Microsoft Windows 98, Windows 98SE, Windows Me, Windows 2000 Professional, Windows XP Home Edition or Windows XP Professional
Standard installation is required.
However, operation is not assured if the above environment is an upgraded OS.

CPU:

MMX Pentium 200 MHz or faster

Display:

Minimum 800 × 600 dot High color (16 bit color, 65,000 colors). (At 800 × 600 dot or less, 256 colors or less, the screen for installing USB driver is not displayed.)

Others:

The USB connector must be provided as standard.
Windows Media Player must be installed (to play back moving pictures).

Notes

- Operations are not guaranteed for the Windows environment if you connect two or more USB equipment to a single computer at the same time, or when using a hub.
- Some equipment may not operate depending on the type of USB equipment that is used simultaneously.
- Operations are not guaranteed for all the recommended computer environments mentioned above.
- Windows and Windows Media are registered trademarks of Microsoft Corporation in the United States and / or other countries.
- Pentium is a trademark or registered trademark of Intel Corporation.
- All other product names mentioned herein may be the trademarks or registered trademarks of their respective companies. Furthermore, "™" and "®" are not mentioned in each case in this manual.

Installing the USB driver

Start the following operation without connecting the USB cable to the computer.
Connect the USB cable according to "Making the computer recognize your camcorder".

If you are using Windows 2000, log in with permission of administrators.
If you are using Windows XP, log in with permission of computer administrators.

(1) Turn on a computer and allow Windows to load. If you have been using the computer, close all software.
(2) Insert the supplied CD-ROM in the CD-ROM drive of the computer. The application software starts up.
If the screen does not appear, double-click "My Computer" and then "ImageMixer" (CD-ROM Drive).
(3) Select "Handycam" on the screen.



The title screen appears.
(4) Move the cursor to "USB Driver" and click. This starts USB driver installation.



(5) Follow the on-screen messages to install the USB driver.
(6) Remove the CD-ROM, then restart the computer and follow the on-screen messages.

Notes

- If you connect the USB cable before USB driver installation is complete, the USB driver will not be properly registered. Carry out installation again following the on-screen messages.
- The title screen is not displayed if the screen size of the computer is set to less than 800 × 600 dots and 256 colors or less. See pages 146, 147 about the recommended computer environment.

Installing Image Transfer

Make sure USB driver installation is complete.

This function enables image data recorded on the “Memory Stick” to be automatically transferred (copied) to your computer.

If you are using Windows 2000, log in with permission of administrators.
If you are using Windows XP, log in with permission of computer administrators.

(1) Turn on your computer and allow Windows to load. If you have been using the computer, close all software.
(2) Insert the supplied CD-ROM in the CD-ROM drive of the computer. The application software starts up.
(3) Select “Handycam” on the screen.
The title screen appears.
(4) Move the cursor to “Image Transfer” and click.



The Install Wizard program starts up and the “Choose Setup Language” screen appears.
(5) Select the language for installation.
(6) Follow the on-screen messages.
The installation screen disappears when installation is complete.

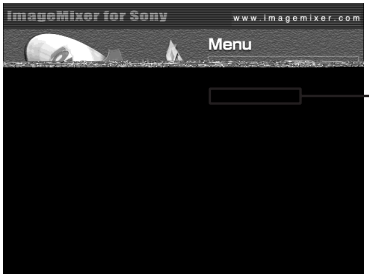
Installing ImageMixer

Make sure USB driver installation is complete.

"ImageMixer Ver.1.5 for Sony" is an application that can capture or edit images, or create video CDs.

To install and use this software in Windows 2000, you must be authorized as administrators. For Windows XP, you must be authorized as computer administrators.

(1) Turn on a computer and allow Windows to load. If you have been using the computer, close all software.
(2) Insert the supplied CD-ROM into the CD-ROM drive of the computer.
The application software starts up.
(3) Select "Handycam" on the screen.
The title screen appears.
(4) Move the cursor to "ImageMixer" and click.



The Install Wizard program starts up and the "Choose Setup Language" screen appears.
(5) Select the language for installation.
(6) Follow the on-screen messages.
The installation screen disappears when installation is complete.
(7) Follow the on-screen messages to install Win ASPI. (Only for Windows 2000, Windows XP users)
(8) If DirectX 8.0a or later is not installed on the computer, continue installation after installing ImageMixer.
Follow the on-screen messages to install DirectX 8.0a. After installation is complete, restart the computer.

MEMORY MIX Album

Once "ImageMixer" is installed, the MEMORY MIX album is created in "Album" of "ImageMixer" and sample images are stored in it.
Those sample images can be transferred from the MEMORY MIX album to a "Memory Stick" so that they can be used in MEMORY MIX (p. 118).

For details on the operation procedure, refer to the on-line help.

Replacing Win ASPI

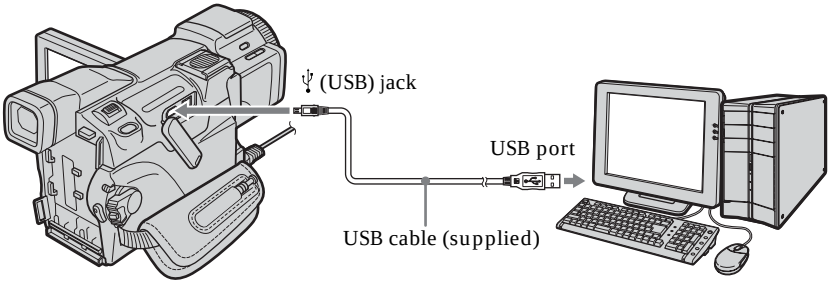
To be able to use the ImageMixer CD writing function, you need to install Win ASPI. If a different writing application was previously installed, its writing function may not work correctly. If that happens, reinstall the original application and replace Win ASPI. Note that the ImageMixer CD writing function may not work properly.

Making the computer recognize your camcorder

If you are using Windows 2000, log in with permission of administrators.
If you are using Windows XP, log in with permission of computer administrators.

Viewing picture recorded on the tape

(1) Connect the AC Adaptor, then set the POWER switch to VCR.
(2) Press FN to display PAGE1.
(3) Press MENU.
(4) Select USB STREAM in [], then press EXEC.
(5) Select ON, then press EXEC.
(6) Connect the ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
The computer recognizes your camcorder, and the Windows Add Hardware Wizard starts.



(7) Follow the on-screen messages so that the Add Hardware Wizard recognizes that the USB drivers have been installed. Be sure to allow the installation to complete without interrupting it.

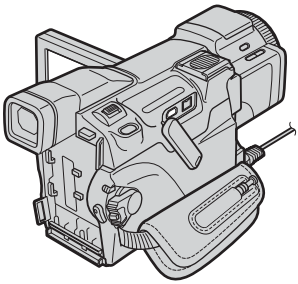
For Windows 2000, Windows XP users
When the dialogue box prompting you to confirm the digital signature appears, select "Yes" if you use Windows 2000 or select "Continue Anyway" if you use Windows XP.

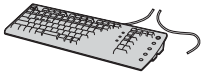
Viewing images recorded on the "Memory Stick"

(1) Insert the "Memory Stick" into your camcorder.

(2) Connect the AC Adaptor, then set the POWER switch to MEMORY.

(3) Connect the ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
The USB MODE indicator appears on the LCD screen of your camcorder. The computer recognizes your camcorder, and the Add Hardware Wizard starts.





(4) Follow the on-screen messages so that the Add Hardware Wizard recognizes that the USB drivers have been installed. The Add Hardware Wizard starts two times because two different USB drivers are installed. Be sure to allow the installation to complete without interrupting it.

You cannot install the USB driver if the "Memory Stick" is not in your camcorder
Be sure to insert the "Memory Stick" into your camcorder before installing the USB driver.

If you cannot install the USB driver

The USB driver has been registered incorrectly as a computer was connected to your camcorder before installation of the USB driver was completed. Follow the procedure below to correctly install the USB driver.

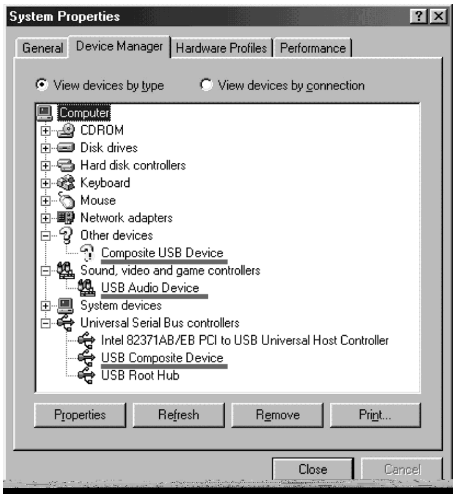
Viewing pictures recorded on the tape

Step 1: Uninstall the incorrect USB driver

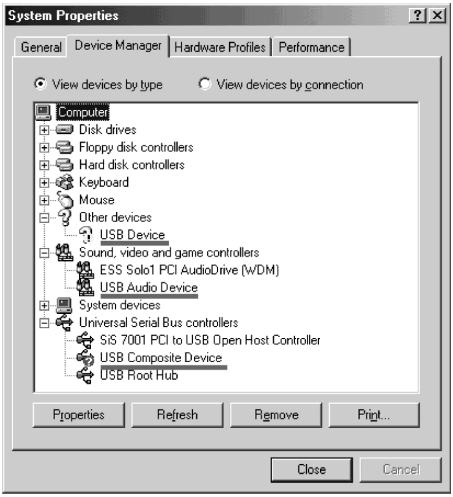
① Turn on the computer and allow Windows to load.
② Connect the AC Adaptor, and set the POWER switch to VCR.
③ Connect the USB port on the computer to the ψ (USB) jack on your camcorder using the supplied USB cable.
④ Open the computer's "Device Manager."

Windows XP:
Select "Start" → "Control Panel" → "System" → "Hardware," and click the "Device Manager" button.
If there is no "System" inside "Pick a category" after clicking "Control Panel," click "Switch to classic view" instead.
Windows 2000:
Select "My Computer" → "Control Panel" → "System" → "Hardware" tab, and click the "Device Manager" button.
Windows 98SE/Windows Me:
Select "My Computer" → "Control Panel" → "System," and click "Device Manager."

⑤ Select and delete the underlined devices below.

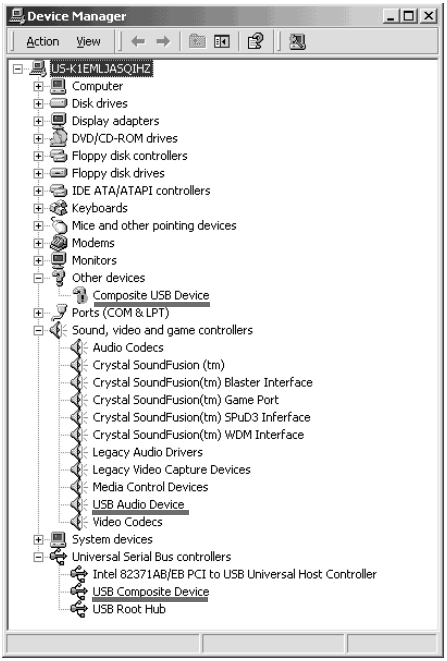


Windows 98SE

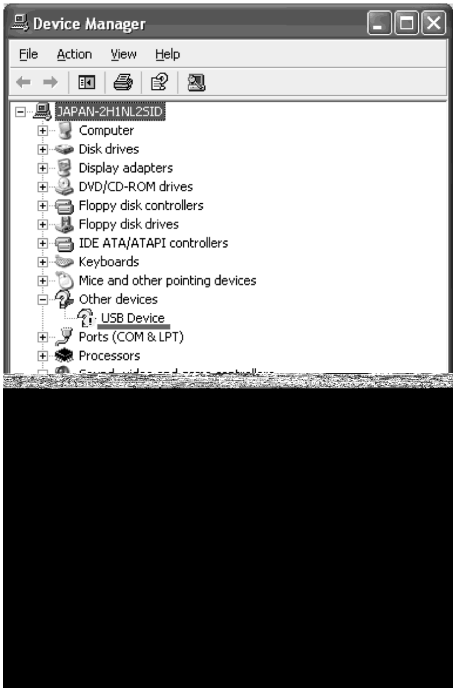


Windows Me

(continued on the following page)



Windows 2000



Windows XP

⑥ Set the POWER switch to OFF (CHG) on your camcorder, then disconnect the USB cable.

⑦ Restart the computer.

Step 2: Install the USB driver on the supplied CD-ROM

Follow the entire procedure in “Installing the USB driver” on page 148.

Viewing images recorded on the "Memory Stick"

Step1: Uninstall the incorrect USB driver

① Turn on the computer and allow Windows to load.
② Insert the "Memory Stick" into your camcorder.
③ Connect the AC Adaptor and set the POWER switch to MEMORY.
④ Connect the USB port on the computer to the ψ (USB) jack on your camcorder using the supplied USB cable.
⑤ Open the computer's "Device Manager."

Windows XP:
Select "Start" → "Control Panel" → "System" → "Hardware," and click the "Device Manager" button.
If there is no "System" inside "Pick a category" after clicking "Control Panel," click "Switch to classic view" instead.

Windows 2000:
Select "My Computer" → "Control Panel" → "System" → "Hardware," and click the "Device Manager" button.

Other OS:
Select "My Computer" → "Control Panel" → "System," and click "Device Manager."

⑥ Select "Other devices."
Select the device prefixed with the "?" mark and delete.
Ex: (?)Sony Handycam
⑦ Set the POWER switch to OFF (CHG) on your camcorder, then disconnect the USB cable.
⑧ Restart the computer.

Step2: Install the USB driver on the supplied CD-ROM

Follow the entire procedure in "Installing the USB driver" on page 148.

Viewing pictures recorded on the tape on a computer – USB Streaming (For Windows users)

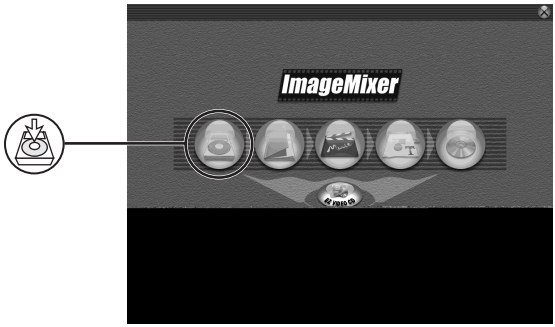
Capturing images with “ImageMixer Ver.1.5 for Sony”

You need to install the USB driver and ImageMixer to view images recorded on the tape on a computer (p. 148, 150).

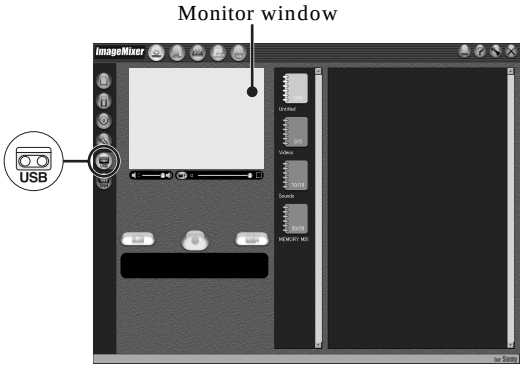
Viewing pictures recorded on the tape

(1) Turn on the computer and allow Windows to load.
(2) Connect the AC Adaptor, then insert the cassette into your camcorder.
(3) Set the POWER switch to VCR.
(4) Press FN to display PAGE1.
(5) Press MENU to display the menu.
(6) Select USB STREAM in , then press EXEC.
(7) Select ON, then press EXEC.
(8) Select “Start” → “Programs” → “PIXELA” → “ImageMixer” → “ImageMixer Ver.1.5 for Sony.”
The “ImageMixer Ver.1.5 for Sony” startup screen appears on the computer.
The title screen appears.

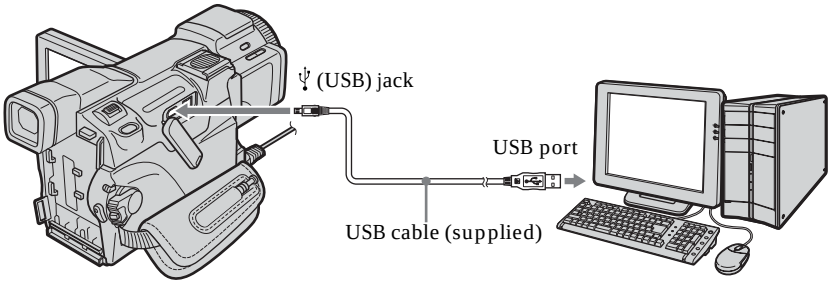
(9) Click on the screen.



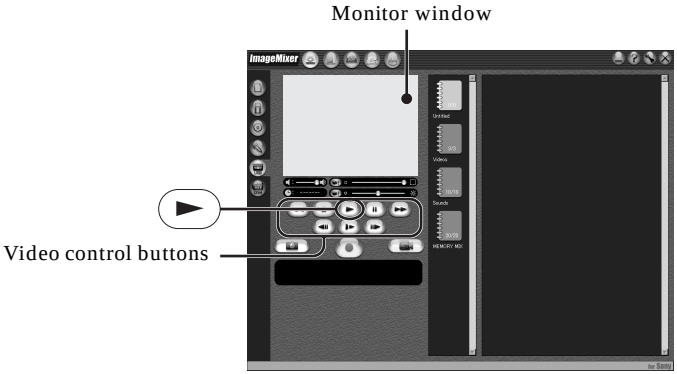
(10) Click .



(11) Connect the ⚶ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.



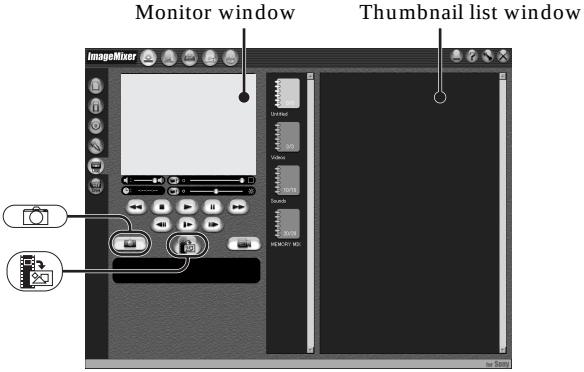
(12) Click ► to start playback.
You can control video operations with the buttons on the screen.
The picture from the tape appears on the monitor window on the computer.



Viewing pictures live from your camcorder

(1) Follow Step 1 and 2 on page 156.
(2) Set the POWER switch to CAMERA.
(3) Follow Step 4 to 11 on pages 156, 157.
The picture from your camcorder appears on the monitor window on the computer.

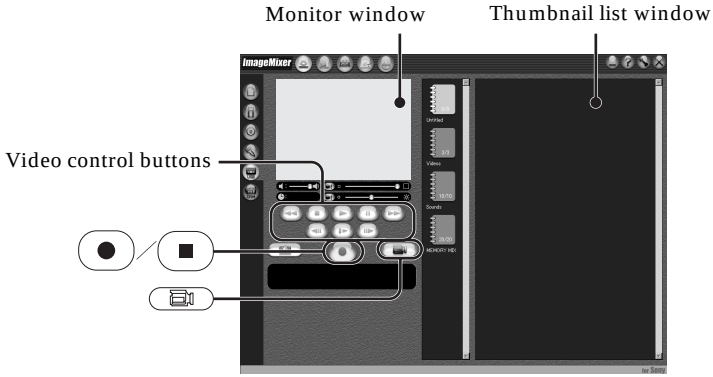
Capturing still images



(1) Click (📷).

(2) Looking at the monitor window, move the cursor to (🖼) and click it at the point you want to capture.
The still image on the screen is captured.
Captured images appear in the thumbnail list window.

Capturing moving pictures



(1) Click (🎞).

(2) Click (▶) to start playback.

(3) Looking at the monitor window, click (●) at the first scene of the movie you want to capture. (●) changes to (■).

(4) Looking at the monitor window, click (■) at the last scene you want to capture.
The moving picture is captured. The captured images appear in the thumbnail list window.

To close "ImageMixer"

Click ⊗ in the upper right corner of the screen.

Notes

- When you view images on a computer with the USB connection, the following may occur. This is not a malfunction.
 – The image shakes up and down.
 – Some images are not displayed correctly due to noise, etc.
 – Some images are displayed with the cracking noise.
 – Images of different color systems to that of your camcorder are not displayed correctly.
- When your camcorder is in standby with a cassette inserted, it turns off automatically after five minutes.
- We recommend setting DEMO MODE to OFF in the menu settings when your camcorder is in standby, and no cassette is inserted.
- Indicators on the screen of your camcorder do not appear on images that are captured into the computer.
- If you capture a fast moving picture, the picture in the monitor window may not move smoothly. You can make the picture move more smoothly by adjusting the slider located just under the right bottom of the monitor window, although this reduces the picture quality.
- You cannot carry out any “Memory Stick” operations during the USB streaming.

If image data cannot be transferred by the USB connection

The USB driver has been registered incorrectly as the computer was connected to your camcorder before installation of the USB driver was complete. Reinstall the USB driver following the procedure on page 153.

If any trouble occurs

Close all running applications, then restart the computer.

Carry out the following operations after quitting the application:

– Disconnect the USB cable.
– Turn the POWER switch to another position on your camcorder.

Making Video CDs – Easy Video CD

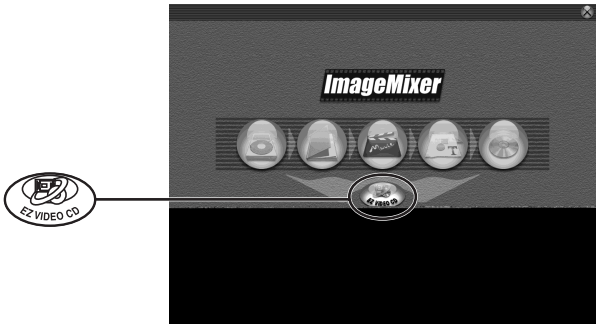
This function makes it simple to create a video CD by capturing images recorded on the tape or images live from your camcorder.

Capturing images recorded on the tape onto a CD-R

(1) Follow Step 1 to 8 on page 156.

(2) Press ■ after choosing the point on the tape from which you want to capture images onto the CD-R.

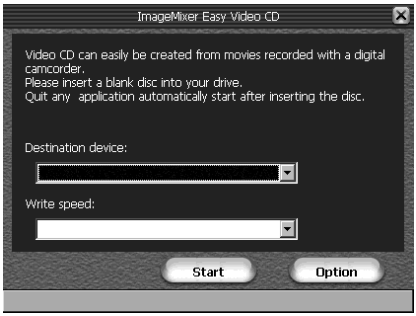
(3) Click EZ VIDEO CD.



(4) Connect the ⚷ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.

(5) Insert a new CD-R in the CD-R drive of the computer.

(6) Click “Start.”



The tape is automatically played back. Easy Video CD automatically begins to capture images onto the CD-R to create a Video CD.

(7) After the “Video CD successfully created.” message appears, click “Quit.”

Capturing images live from your camcorder onto a CD-R

Eject the cassette beforehand if inserted. If the cassette is inserted, your camcorder automatically turns off when it has been in recording standby for more than five minutes.

(1) Follow Step 1 and 2 on page 156.
(2) Set the POWER switch to CAMERA on your camcorder.
(3) Follow Step 4 to 8 on page 156.
(4) Follow Step 3 to 7 in "Capturing images recorded on the tape onto a CD-R" on page 160.

Notes

- A computer equipped with a CD-R drive is required.
- Do not press any buttons on your camcorder while creating a video CD. If you press ■, images on the tape are recorded on the video CD up to the point where you have pressed ■ and Easy Video CD quits.
- Once you have created a video CD, you cannot add any images onto the CD.
- On the "Option" screen, select the hard disk that has enough space (more than about 6 GB) for the "Location of work folder."

Playing back a video CD

You can play back the video CD you made on a DVD player or on a computer equipped with a DVD drive.
To play back a Video CD on the computer, application software that supports a Video CD needs to be installed in it.

You can play back a Video CD using the Windows Media Player. However, you may not be able to play back a Video CD depending on your computer environment including Operating Systems or hardware. Menu functions of the Windows Media Player do not function.

(1) Start up the Windows Media Player.

Windows XP:
Select "Start" → "All Programs" → "Accessories" → "Entertainment," and click the "Windows Media Player."
Other Operating Systems:
Select "Start" → "Programs" → "Accessories" → "Entertainment," and click the "Windows Media Player."

(2) Select "My computer" → "CD-R," and click "MPEGAV" folder, then drag and drop the moving picture file "□□□*.DAT" onto the screen of the Windows Media Player. The moving picture is played back.

* The file number is displayed in the □□□.

Maximum recording time on a video CD is about one hour.
Easy Video CD divides the images to be captured into about 4 GB and captures each of the divided files every ten minutes due to the specifications of the AVI format. A few seconds of images may drop out at the jointed part between the divided files when playing back the recorded files.

Seeing the on-line help (operating instructions) of ImageMixer

A “ImageMixer Ver.1.5 for Sony” on-line help site is available where you can find the detailed operating method of “ImageMixer Ver.1.5 for Sony.”

(1) Click ⓘ located in the upper-right corner of the screen.
The ImageMixer’s Manual screen appears.
(2) You can find the information you need from the list of contents.

To close the on-line help

Click ☒ at the top right of the screen.

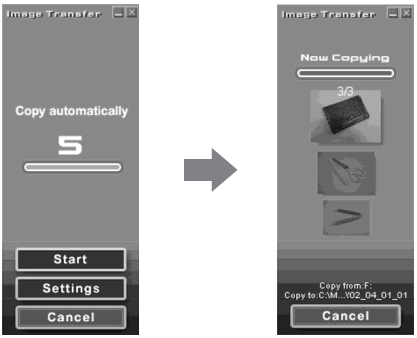
If you have any questions about ImageMixer

“ImageMixer Ver.1.5 for Sony” is the product of PIXELA corporation. For details, refer to the operating instructions of the CD-ROM supplied with your camcorder.

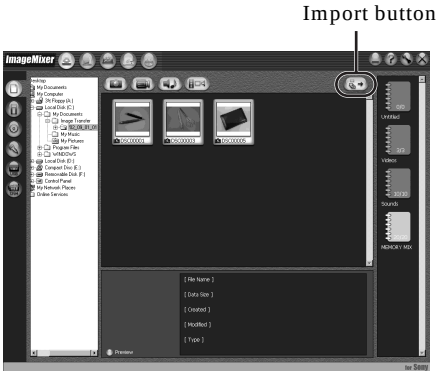
Viewing images recorded on the “Memory Stick” on a computer (For Windows users)

The image data recorded on the “Memory Stick” is automatically transferred (copied) to a computer with Image Transfer. You can view images with ImageMixer.
You need to install the USB driver and Image Transfer to view the “Memory Stick” images on a computer (p. 148, 149).

(1) Turn on the computer and allow Windows to load.
(2) Insert the “Memory Stick” into your camcorder, then connect the AC Adaptor to you camcorder.
(3) Set the POWER switch to MEMORY.
(4) Connect the (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
(5) Image Transfer automatically starts up and the transfer of image data begins.



(6) ImageMixer automatically starts up, enabling you to view the copied image.



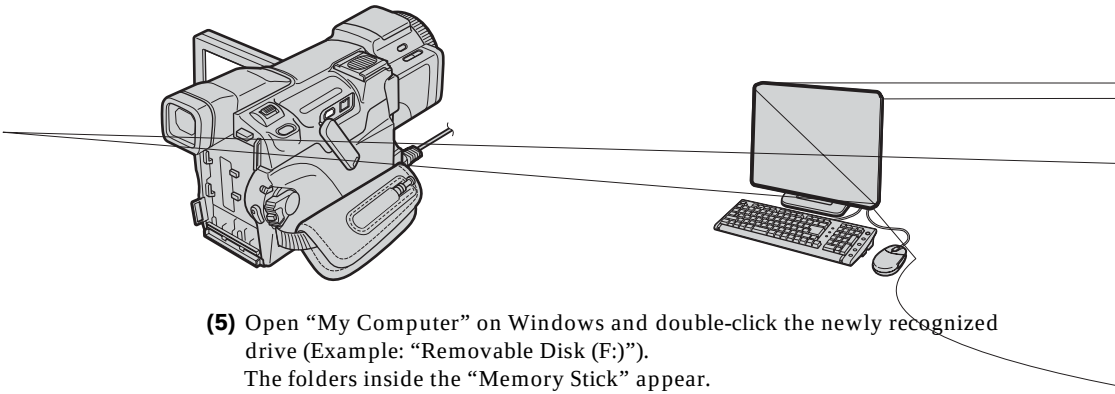
(7) Select an album and the image, then press the import button. The image is added to your album, and you can edit the image.

Viewing images without Image Transfer

Before operation

- You need to install the USB driver to view the "Memory Stick" images on a computer (p. 148).
- An application such as Windows Media Player must be installed to play back moving pictures in Windows environment.

(1) Turn on the computer and allow Windows to load.
(2) Insert the "Memory Stick" into your camcorder, then connect the AC Adaptor to your camcorder.
(3) Set the POWER switch to MEMORY.
(4) Connect the ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
The USB MODE indicator appears on the screen of your camcorder.



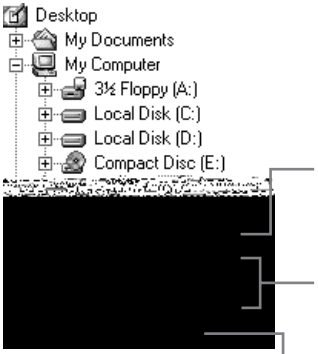
(5) Open "My Computer" on Windows and double-click the newly recognized drive (Example: "Removable Disk (F:)").
The folders inside the "Memory Stick" appear.
(6) Double-click a desired image file after opening the folders in the following order.
"DCIM" folder → "□□□ MSDCF" folder [1] → Image file [2]
See "Image file storage destinations and image files" (p. 165), for the details on the folder and file name.

[1] □□□ stands for any number (within the range) from 101 to 999.
[2] Copying a file to the hard disk of the computer before viewing it is recommended. If you play back the file directly from the "Memory Stick," the image and sound may be damaged.

Image file storage destinations and image files

Image files recorded with your camcorder are grouped in folders.
The meanings of the file names are as follows. □□□□ stands for any number within the range from 0001 to 9999.

For Windows Me users (When your camcorder is recognized as the drive [F:])



Folder containing image files recorded using other camcorders without the folder creation function (for playback only)

Folder containing image files recorded with your camcorder
When no new folders have been created, there is only "101MSDCF."

Folder containing moving picture data recorded using other camcorders without the folder creation function (for playback only)

Folder	File	Meaning
101MSDCF	DSC0□□□□.JPG	Still image file
(up to 999MSDCF)	MOV0□□□□.MPG	Moving picture file

Disconnect the USB cable and eject the "Memory Stick" or set the POWER switch to OFF (CHG)

For Windows 2000, Windows Me, Windows XP users

(1) Move the cursor to the "Unplug or Eject Hardware" on the Task Tray and click it to cancel the applicable drive.
(2) After the "Safe to remove" message appears, disconnect the USB cable and eject the "Memory Stick" or set the POWER switch to OFF (CHG).

Connecting your camcorder to a computer using the USB cable (For Macintosh users)

When connecting to a computer with the USB cable

You must **install a USB driver** onto a computer in order to connect your camcorder to the computer's USB port. The USB driver can be found on the CD-ROM supplied, along with the application software required for viewing images.

Recommended Macintosh environment

Mac OS 8.5.1 / 8.6 / 9.0 / 9.1 / 9.2 or Mac OS X (v10.0 / v10.1 / v10.2) standard installation is required.
However, note that the update to Mac OS 9.0 / 9.1 should be used for the following models.

- iMac with the Mac OS 8.6 standard installation and a slot loading type CD-ROM drive
- iBook or Power Mac G4 with the Mac OS 8.6 standard installation

The USB port must be provided as standard.

QuickTime 3.0 or newer must be installed to play back moving pictures.

Notes

- Operations are not guaranteed for the Macintosh environment if you connect two or more USB equipment to a single computer at the same time, or when using a hub.
- Some equipment may not operate depending on the type of USB equipment that is used simultaneously.
- Operations are not guaranteed for all the recommended computer environments mentioned above.
- Macintosh and Mac OS, iBook, Power Mac or QuickTime are trademarks of Apple Computer Inc.
- All other product names mentioned herein may be the trademarks or registered trademarks of their respective companies. Furthermore, "™" and "®" are not mentioned in each case in this manual.

Installing the USB driver

Do not connect the USB cable to a computer before installation of the USB driver is complete.

For Mac OS 8.5.1/8.6/9.0 users

(1) Turn on the computer and allow the Mac OS to load. If you have been using the computer, close all software.

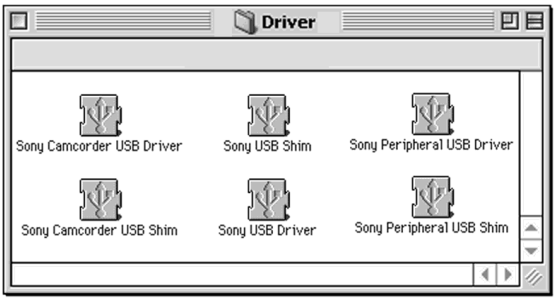
(2) Insert the supplied CD-ROM in the CD-ROM drive of the computer.
The application software screen appears.

(3) Select "Handycam" on the screen.
The title screen appears.

(4) Click "USB Driver" to open the folder containing the six files related to "Driver."



(5) Select the following two files, and drag and drop them into the System Folder.
- Sony Camcorder USB Driver
- Sony Camcorder USB Shim



(6) When the message appears, click "OK."
The USB driver is installed on the computer.

(7) Eject the CD-ROM from the computer.

(8) Restart the computer.

For Mac OS 9.1/9.2/Mac OS X (v10.0/v10.1/v10.2)

The USB driver needs not be installed. Your camcorder is automatically recognized as a drive just by connecting your Mac using the USB cable.

Viewing images recorded on “Memory Stick” on a computer (For Macintosh users)

Viewing images

Before operation

- You need to install the USB driver to view the “Memory Stick” images on a computer (p. 167).
- QuickTime 3.0 or newer must be installed to play back moving pictures.

(1) Turn on the computer and allow Mac OS to load.
(2) Insert the “Memory Stick” into your camcorder, then connect the AC Adaptor to your camcorder.
(3) Set the POWER switch to MEMORY.
(4) Connect the ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
The USB MODE indicator appears on the screen of your camcorder.
(5) Double-click the “Memory Stick” icon on the desktop.
The folders inside the “Memory Stick” are displayed.
(6) Double-click a desired image file after opening the folders in the following order.
“DCIM” folder → “□□□ MSDCF” folder [1] → Image file [2]

[1] □□□ stands for any number (within the range) from 101 to 999.
[2] Copying a file to the hard disk of the computer before viewing it is recommended. If you play back the file directly from the “Memory Stick,” the image and sound may be damaged.

Disconnect the USB cable and eject the “Memory Stick” or set the POWER switch to OFF (CHG)

(1) Close all running applications.
Make sure that the “Memory Stick” access lamp of your camcorder is not lit.
(2) Drag the “Memory Stick” icon into the “Trash.” Alternatively, select the “Memory Stick” icon by clicking on it, then select “Eject disk” from the “Special” menu at the top left of the screen.
(3) Disconnect the USB cable and eject the “Memory Stick” or set the POWER switch to OFF (CHG).

For Mac OS X (v10.0) users

Shut down the computer, then disconnect the USB cable and eject the “Memory Stick” or set the POWER switch to OFF (CHG).

Capturing images from an analog video unit on a computer – Signal convert function

You can capture images and sound from an analog video unit connected to a computer which has the DV port via your camcorder.

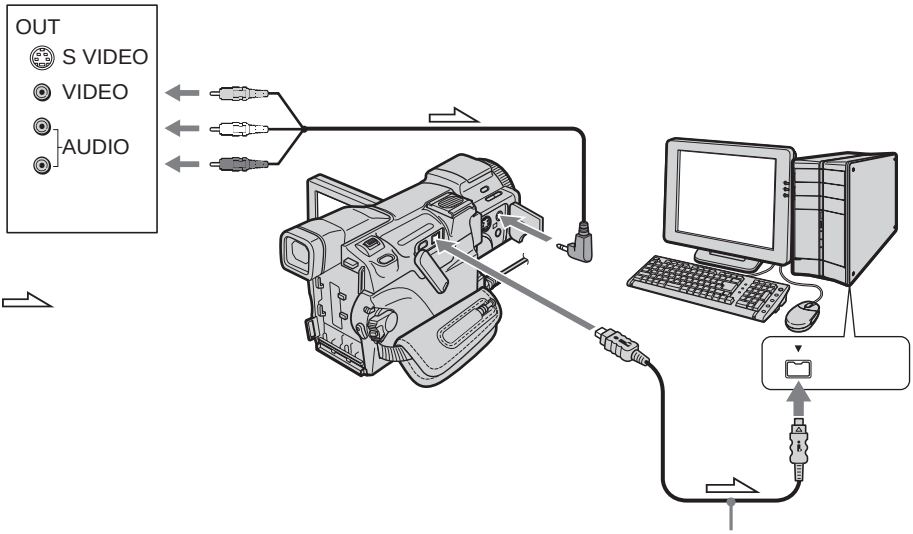
Before operation

Set DISPLAY in ETC to LCD in the menu settings. (The default setting is LCD.)

The POWER switch should be set to VCR .

Operate by touching the panel.

(1) Press FN to display PAGE1.
(2) Press MENU.
(3) Select A / V → DV OUT in , then press EXEC.
(4) Select ON, then press EXEC.
(5) Start playback on the analog video unit.
(6) Start capturing procedures on the computer.
The operation procedures depend on the computer and the software you are using.
For details of how to capture images, refer to the operating instructions of the computer and software.



After capturing images and sound

Stop capturing procedures on the computer, and stop playback on the analog video unit.

Notes

- You need the software and computer that support the exchange of digital video signals.
- Depending on the condition of the analog video signals, the computer may not be able to output the images correctly when you convert video signals to digital video signals via your camcorder. Depending on the analog video unit, the image may contain noise or incorrect colors.
- You cannot record or capture the video output via your camcorder when the video tapes include copyright protection signals such as the ID-2 system.

If the computer has a USB port

You can connect using a USB cable, but images may not be transferred smoothly.

If your VCR has an S video jack

Pictures can be reproduced more faithfully by using an S video cable (optional).
With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable.
Connect an S video cable (optional) to the S video jacks of both your camcorder and the VCR.

Accessing the network

– DCR-TRV70 only

You can access the Internet using a USB device that complies with your camcorder. Once the access is made, you can view a Web page, send / receive your e-mail, etc. This section describes only how to open the network menu.

The POWER switch should be set to (MEMORY/NETWORK).

Operate by touching the panel with the stylus.

Press NETWORK.
The network menu appears.

For details, refer to the Network Function / Application Operating Instructions supplied with your camcorder.

Note

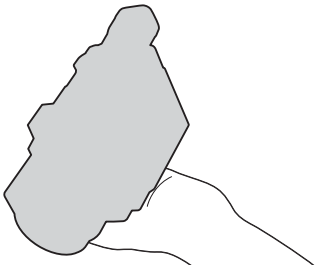
- Make sure that your camcorder is in standby with the POWER switch set to MEMORY / NETWORK.
- Do not remove the power source while operating the network functions or your network settings may be erased. Also, close the network function before you turn the POWER switch.

On trademarks

All product names mentioned herein may be the trademarks or registered trademarks of their respective companies. Furthermore, "™" and "®" are not mentioned in each case in this manual.

How to hold your camcorder when operating network functions

Hold your camcorder with your hand through the grip belt to keep from dropping it. The operation buttons needed for network functions are displayed on the LCD screen. Press the buttons with the supplied stylus.



After using the stylus

Put it back in the stylus holder. Hold the stylus correctly as illustrated and insert it until it clicks.

C the menu settings

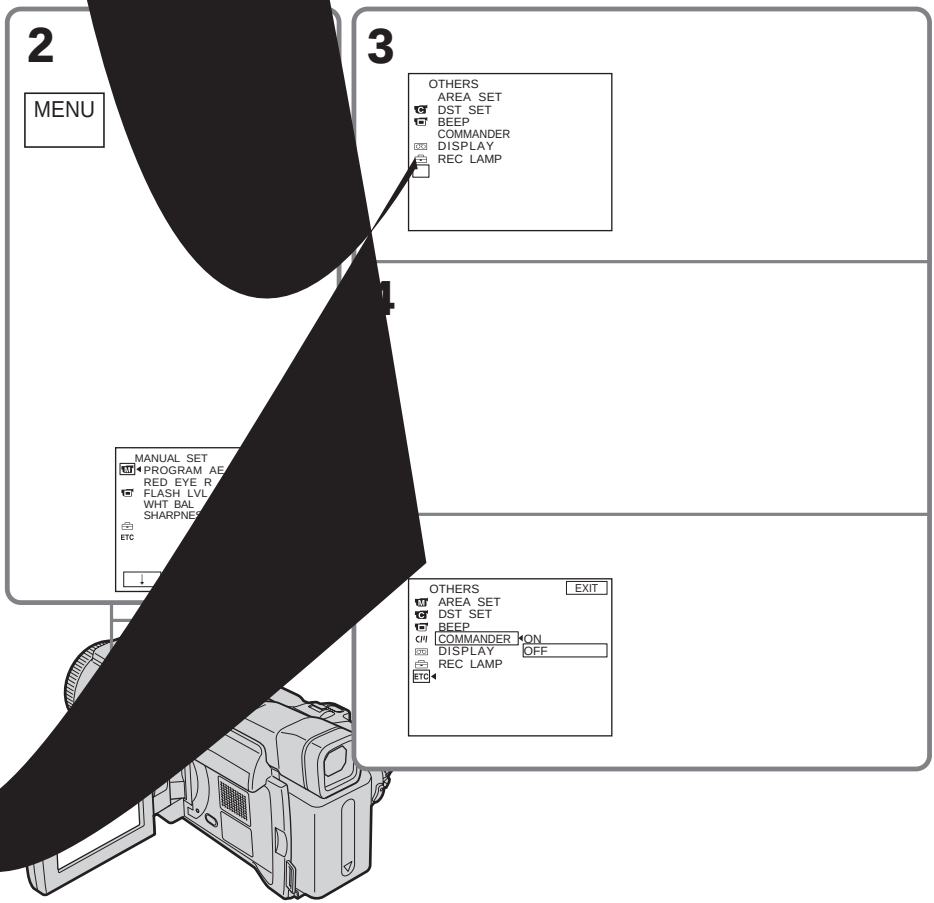
mode settings in the menu settings, select the menu items with ↓/↑. The can be partially changed. First, select the icon, then the menu item and g.

ch should be set to (CAMERA), (VCR) or (MEMORY).
ng the panel.

splay PAGE1.

ect a desired icon, then press EXEC.
ct a desired item, then press EXEC.
t a desired setting, then press EXEC.
5 if you want to change other items. Press ⮌ RET. to return to

g the mode setting of each item" (p. 173).



To return to FN
Press EXIT.

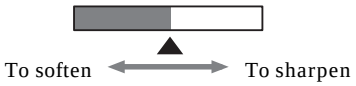
Menu items are displayed as the following icons:

- MANUAL SET
- CAMERA SET
- VCR SET
- LCD / VF SET
- MEM SET 1
- MEM SET 2
- CM SET
- TAPE SET
- SETUP MENU
- OTHERS

Selecting the mode setting of each item

● is the default setting.

Menu items differ depending on the position of the POWER switch.
The screen shows only the items you can operate at the moment.

Icon/item	Mode	Meaning	POWER switch
MANUAL SET			
PROGRAM AE	——	To suit your specific shooting requirement (p. 59)	CAMERA, MEMORY
P EFFECT	——	To add special effects like those in movies or on the TV to images (p. 55, 71)	VCR, CAMERA
RED EYE R	● OFF	Red-eye reduction does not function.	CAMERA, MEMORY
	ON	Preliminary flash before recording prevents red-eye.	
FLASH LVL	HIGH	To make the flash level higher than normal	CAMERA, MEMORY
	● NORMAL	To use the normal setting	
	LOW	To make the flash level lower than normal	
WHT BAL	——	To adjust the white balance (p. 49)	CAMERA, MEMORY
SHARPNESS	——	To adjust the sharpness of the image outline with ↑/↓ 	CAMERA, MEMORY
AUTO SHTR	● ON	To automatically activate the electronic shutter* when shooting in bright conditions	CAMERA
	OFF	To not automatically activate the electronic shutter* even when shooting in bright conditions	

*** About the electronic shutter**

The electronic shutter is the function used to adjust the shutter speed electrically.

Note on FLASH LVL and RED EYE R

You cannot adjust FLASH LVL and RED EYE R if the external flash (optional) is not compatible.

(continued on the following page)

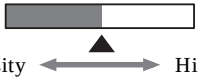
Icon/item	Mode	Meaning	POWER switch
CAMERA SET			
D ZOOM	● OFF	To deactivate the digital zoom. Up to 10× zoom is performed.	CAMERA
	20×	To activate the digital zoom. More than 10× to 20× zoom is performed digitally (p. 33).	
	120×	To activate the digital zoom. More than 10× to 120× zoom is performed digitally.	
EXPANDED F	● OFF	To deactivate the expanded focus	MEMORY
	ON	While focusing manually, the center of the screen is displayed at twice the size (p. 63).	
16:9WIDE	● OFF	To not record a 16:9 wide picture	CAMERA
	ON	To record a 16:9 wide picture (p. 50)	
STEADYSHOT	● ON	To compensate for camera-shake	CAMERA
	OFF	To cancel SteadyShot. Natural pictures are produced when shooting a stationary subject with a tripod.	
HOLOGRAM F	● AUTO	The HOLOGRAM AF emits light when focusing on subjects is difficult in dark places (p. 115).	MEMORY
	OFF	The HOLOGRAM AF does not emit light.	
N.S. LIGHT	● ON	To use the NightShot Light (p. 35)	CAMERA MEMORY
	OFF	To cancel the NightShot Light	

Notes on SteadyShot

• SteadyShot will not correct excessive camera-shake.
• Attachment of a conversion lens (optional) may influence SteadyShot.

If you cancel SteadyShot

The "SteadyShot off" indicator appears. Your camcorder prevents excessive compensation for camera-shake.

Icon/item	Mode	Meaning	POWER switch
VCR SET			
HiFi SOUND	● STEREO	To play back a stereo tape or dual sound track tape with main and sub sound (p. 195)	VCR
	1	To play back the stereo tape with the left sound or a dual sound track tape with main sound	
	2	To play back a stereo tape with the right sound or a dual sound track tape with sub sound	
AUDIO MIX	——	To adjust the balance between stereo 1 and stereo 2 (p. 96) 	VCR
A/V → DV OUT	● OFF	To output digital images and sound in analog format using your camcorder	VCR
	ON	To output analog images and sound in digital format using your camcorder (p. 169)	
LCD/VF SET			
LCD B.L.	● BRT NORMAL	To set the brightness on the LCD screen to normal	VCR CAMERA MEMORY
	BRIGHT	To brighten the LCD screen	
LCD COLOR	——	To adjust the color on the LCD screen with ↓/↑ 	VCR CAMERA MEMORY
VF B.L.	● BRT NORMAL	To set the brightness on the viewfinder screen to normal	VCR CAMERA MEMORY
	BRIGHT	To brighten the viewfinder screen	

Notes on LCD B.L. and VF B.L.

- When you select BRIGHT, battery life is reduced by about 10 percent during recording.
- When you use power sources other than the battery pack, BRIGHT is automatically selected.

Even if you adjust LCD B.L., LCD COLOR and VF B.L.

The recorded picture will not be affected.

(continued on the following page)

Icon/item	Mode	Meaning	POWER switch
MEM SET 1			
STILL SET			
BURST	● OFF	To not record continuously	(MEMORY)
	NORMAL	To record from 4 to 25 images continuously (p. 111)	
	HIGH SPEED	To record up to 32 images continuously fast	
	EXP BRKTG	To record three images continuously with different exposure	
QUALITY	● FINE	To record still images in the fine image quality (p. 105)	(VCR) (MEMORY)
	STANDARD	To record still images in the standard image quality	
IMAGESIZE	● 1600 × 1200	To record still images in 1600 × 1200 size (p. 106)	(MEMORY)
	640 × 480	To record still images in 640 × 480 size	
MOVIE SET			
IMAGESIZE	● 320 × 240	To record moving pictures in 320 × 240 size (p. 107)	(VCR) (MEMORY)
	160 × 112	To record moving pictures in 160 × 112 size	
REMAIN	● AUTO	To display the remaining capacity of the "Memory Stick" in the following cases: • For about five seconds after setting the POWER switch to MEMORY or VCR and inserting a "Memory Stick" • When the remaining capacity of the "Memory Stick" is less than two minutes after setting the POWER switch to MEMORY • For about five seconds from the start of moving picture recording • For about five seconds after completing moving picture recording	(VCR) (MEMORY)
	ON	To always display the remaining capacity of the "Memory Stick"	
NEW FOLDER	● ADD	To create a new folder (p.129)	(MEMORY)
	RETURN	To cancel creating a new folder	
REC FOLDER	——	To choose the recording folder (p. 129)	(MEMORY)
FILE NO.	● SERIES	To assign file numbers in sequence even if the "Memory Stick" is changed. The file number is reset to 0001, however, when a new folder is created or the recording folder is changed.	(VCR) (MEMORY)
	RESET	To reset the file number to 0001 each time the "Memory Stick" is changed.	

When you select image quality

The number of images you can shoot in the currently selected image quality appears on the screen.

Icon/item	Mode	Meaning	POWER switch
MEM SET 2			
SLIDE SHOW	RETURN	To cancel slide show	MEMORY
	● ALL FILES	To execute slide show by playing back all the images on the "Memory Stick" (p. 136)	
	FOLDER □□□*	To execute slide show by playing back all the images in the selected playback folder	
INT. R -STL	ON	To activate Interval Photo Recording (p. 121)	MEMORY
	● OFF	To deactivate Interval Photo Recording	
	SET	To set INTERVAL for Interval Photo Recording	
DELETE ALL	● RETURN	To cancel deleting all the image	MEMORY
	ALL FILES	To delete all the unprotected images (p. 140)	
	FOLDER □□□*	To delete all the images in the selected playback folder	
FORMAT	● RETURN	To cancel formatting	MEMORY
	OK	To format the inserted "Memory Stick" (p. 103) Formatting erases all information on the "Memory Stick." Check the contents of the "Memory Stick" before formatting. 1. Select FORMAT, then press EXEC. 2. Select OK, then press EXEC. 3. After the EXECUTE indicator appears, press EXEC. The FORMATTING indicator flashes while formatting. The COMPLETE indicator appears when formatting is complete.	

* The folder number is displayed in the □□□.

Notes on formatting

- Do not do any of the following while the FORMATTING indicator is displayed:
 – Turn the POWER switch to other positions.
 – Operate buttons.
 – Eject the "Memory Stick."
- The "Memory Stick" supplied with your camcorder has been formatted at factory. Formatting the "Memory Stick" with your camcorder is not required.
- You cannot format the "Memory Stick" if the write-protect tab on the "Memory Stick" is set to LOCK.
- Format the "Memory Stick" if the "FORMAT ERROR" indicator appears.
- Formatting erases sample images on the supplied "Memory Stick."
- Formatting erases protected image data on the "Memory Stick."
- Formatting erases newly created folders as well.

(continued on the following page)

Icon/item	Mode	Meaning	POWER switch
CM SET			
TITLE	——	To superimpose a title or make your own title (p. 97, 99)	VCR CAMERA
TITLEERASE	——	To erase the title you have superimposed (p. 98)	VCR CAMERA
TITLE DSPL	● ON	To display the title you have superimposed	VCR
	OFF	To not display the title (p. 98)	
CM SEARCH	● ON	To search using Cassette Memory (p. 75, 76)	VCR
	OFF	To search without using Cassette Memory	
TAPE TITLE	——	To label the cassette (p. 100)	VCR CAMERA
ERASE ALL	● RETURN	To cancel erasing all	VCR CAMERA
	OK	To erase all the data in Cassette Memory (p. 101)	

Icon/item	Mode	Meaning	POWER switch
TAPE SET			
REC MODE	● SP	To record in the SP (Standard Play) mode	VCR CAMERA
	LP	To increase the recording time to 1.5 times the SP mode	
AUDIO MODE	● 12BIT	To record in the 12-bit mode (two stereo sounds)	VCR CAMERA
	16BIT	To record in the 16-bit mode (the one stereo sound with high quality)	
REMAIN	● AUTO	To display the remaining tape indicator: • For about eight seconds after the POWER switch is set to VCR or CAMERA with the cassette inserted, and your camcorder calculates the remaining amount of tape • For about eight seconds after the POWER switch is set to VCR and ► II is pressed	VCR CAMERA
	ON	To always display the remaining tape indicator	
FRAME REC	● OFF	To deactivate frame recording	C
	ON	To activate frame recording (p. 67)	
INT. REC	ON	To activate Interval Recording (p. 66)	
	● OFF	To deactivate Interval Recording	
	SET	To set INTERVAL and REC TIME for Interval Recording	

Notes on the LP mode

- When you record the tape in the LP mode on your camcorder, we recommend playing back the tape on your camcorder. When you play back the tape on other camcorders or VCRs, mosaic noise may occur in pictures or sound.
- When you record in the LP mode, we recommend using a Sony Excellence / Master mini DV cassette so that you can get the most out of your camcorder.
- You cannot make audio dubbing on the tape recorded in the LP mode. Use the SP mode for the tape to be audio dubbed.
- When you mix recordings in the SP mode and in the LP mode on one tape, the playback picture may be distorted or the time code may not be written properly between scenes.

Notes on AUDIO MODE

- You cannot dub audio sound on the tape recorded in the 16-bit mode.
- When playing back the tape recorded in the 16-bit mode, you cannot adjust the balance in AUDIO MIX.

Icon/item	Mode	Meaning	POWER switch
SETUP MENU			
CLOCK SET	——	To set the date or time (p. 20)	CAMERA, MEMORY
USB STREAM	● OFF	To deactivate the USB Streaming function	VCR
	ON	To activate the USB Streaming function	CAMERA
LANGUAGE	● ENGLISH	To display the information indicators in English: min, REC, STBY, START, etc.	VCR, CAMERA
	FRANÇAIS	To display the information indicators in French	MEMORY
	ESPAÑOL	To display the information indicators in Spanish	
	PORTUGUÊS	To display the information indicators in Portuguese	
	中文	To display the information indicators in Chinese	
	한국어	To display the information indicators in Korean	
DEMO MODE	● ON	To make the demonstration appear	CAMERA
	OFF	To cancel the demonstration mode	

Notes on DEMO MODE

- You cannot select DEMO MODE when a cassette or a “Memory Stick” is inserted in your camcorder.
- When NIGHTSHOT switch is set to ON, the ”NIGHTSHOT” indicator appears on the screen and you cannot select DEMO MODE in the menu settings.
- If you press the touch panel during the demonstration, the demonstration stops for a while, then it starts again after about 10 minutes.
- DEMO MODE is set to STBY (Standby) at the default setting and the demonstration starts about 10 minutes after you set the POWER switch to CAMERA without a cassette or a “Memory Stick” inserted.
 To cancel the demonstration, insert a cassette or a “Memory Stick”, set the POWER switch to other than CAMERA, or set DEMO MODE to OFF. To set DEMO MODE to STBY (Standby) again, set it to ON in the menu settings, set the POWER switch to OFF (CHG), then back to CAMERA.

Icon/item	Mode	Meaning	POWER switch
ETC **OTHERS**			
DATA CODE (On the Remote Commander)	● DATE/CAM	To display date, time and various settings during playback when you press DATA CODE on the Remote Commander (p. 40)	(VCR) (MEMORY)
	DATE	To display date and time during playback when you press DATA CODE on the Remote Commander	
AREA SET	——	Temporarily change the area where you are using your camcorder	(CAMERA) (MEMORY)
DEMO SET	● OFF	[illegible]	[illegible]
		[illegible]	
		[illegible]	
		[illegible]	
		[illegible]	
		[illegible]	

[illegible] screen for some models.

[illegible] DISPLAY to V-OUT/LCD in the menu [illegible] will not appear on the LCD screen even when [illegible] output to the TV or VCR.

When recording a close subject

When REC LAMP is set to ON, the red camera recording lamp on the front of your camcorder may reflect on the subject if it is close. In this case, we recommend you set REC LAMP to OFF.

In more than five minutes after removing the power source

The PROGRAM AE, FLASH LVL, AUDIO MIX, WHT BAL, HiFi SOUND and COMMANDER items are returned to their default settings.
Other menu items are held in memory even when the power source is removed.

Types of trouble and how to correct trouble

If you run into any problem using your camcorder, use the following table to troubleshoot the problem. If the problem persists, remove the power source and contact your Sony dealer. If "C:□□:□□" appears on the screen, the self-diagnosis display function has activated. See page 191.

During recording

Symptom	Cause and/or Corrective Actions
START/STOP does not operate.	• The POWER switch is not set to CAMERA. → Set it to CAMERA (p. 25). • Your camcorder automatically turns off to prevent the battery pack from running out and to protect the tape when your camcorder has been in recording standby for more than five minutes. → Set the POWER switch to OFF (CHG) and then to CAMERA. • The tape has run out. → Rewind the tape or insert a new one (p. 8, 39). • The write-protect tab is set to SAVE ◢. → Use a new cassette or slide the tab (p. 8, 195). • The tape is stuck to the drum (moisture condensation). → Remove the cassette and leave your camcorder for at least one hour to acclimatize (p. 202).
The power goes off.	• Your camcorder automatically turns off to prevent the battery pack from running out and to protect the tape when your camcorder has been in recording standby for more than five minutes. → Set the POWER switch to OFF (CHG) and then to CAMERA. • The battery pack is dead or nearly dead. → Install a fully charged battery pack.
The picture in the viewfinder is not clear.	• The viewfinder lens is not adjusted. → Adjust the viewfinder lens (p. 31).
SteadyShot does not work.	• STEADYSHOT in [C] is set to OFF in the menu settings. → Set it to ON (p. 174).
The autofocusing function does not work.	• The setting is the manual focus. → Press FOCUS to enable the autofocus (p. 63). • Shooting conditions are not suitable for autofocus. → Adjust the focus manually (p. 63).
The picture does not appear in the viewfinder.	• The LCD panel is open. → Close the LCD panel (p. 28).
A vertical band appears when you shoot a subject such as lights or a candle flame against a dark background.	• The contrast between the subject and background is too high. This is not a malfunction.

(continued on the following page)

Symptom	Cause and/or Corrective Actions
A vertical band appears when you shoot a very bright subject.	• This is not a malfunction.
Some tiny spots in white, red, blue or green appear on the screen.	• SLOW SHTR, Super NightShot or Color Slow Shutter is activated. This is not a malfunction.
An unknown picture appears on the screen.	• If about 10 minutes elapse after you set the POWER switch to CAMERA or DEMO MODE is set to ON in the menu settings without a cassette or a “Memory Stick” inserted, your camcorder automatically starts the demonstration. → Insert a cassette or a “Memory Stick” or press the LCD screen. The demonstration stops. You can also set DEMO MODE to OFF in the menu settings (p. 180).
The picture is recorded in incorrect or unnatural colors.	• NIGHTSHOT is slid to ON. → Slide it to OFF (p. 34).
Picture appears too bright, and the subject does not appear on the screen.	• NIGHTSHOT is slid to ON in a bright place. → Slide it to OFF (p. 34). • The back light function is active. → Set it off (p. 34).
The click of the shutter does not sound.	• BEEP in ETC is set to OFF in the menu settings. → Set it to MELODY or NORMAL (p. 181).
Black bands appear when you record a TV screen or computer screen.	→ Set STEADYSHOT in to OFF in the menu settings (p. 174).
An external flash (optional) does not work.	• The power of the external flash (optional) is off or the power source is not installed. → Turn on the external flash (optional) or install the power source. • Two or more external flashes (optional) are attached. → Only one external flash (optional) can be attached.
Flickering or changes in color occurs.	• These phenomena appear if you are recording in the soft portrait or sports lesson mode of PROGRAM AE under a discharge tube such as a fluorescent lamp, sodium lamp or mercury lamp. This is not a malfunction. → Set PROGRAM AE to AUTO in the menu settings.

During playback

Symptom	Cause and/or Corrective Actions
The playback button does not work.	• The cassette has run out of the tape. → Rewind the tape (p. 39).
There are horizontal lines on the picture or the playback picture is not clear or does not appear.	• The video head may be dirty. → Clean the head using the cleaning cassette (optional) (p. 203).
No sound or only a low sound is heard when playing back the tape.	• The stereo tape is played back with HiFi SOUND in MENU set to 2 in the menu settings. → Set HiFi SOUND to STEREO (p. 175). • Volume is turned to minimum. → Turn up the volume (p. 39). • AUDIO MIX in MENU is set to the ST2 side in the menu settings. → Adjust AUDIO MIX (p. 175).
The sound breaks off.	• The video head may be dirty. → Clean the head using the cleaning cassette (optional) (p. 203).
Displaying the record date, Date search does not work.	• The cassette has no Cassette Memory. → Use a cassette with Cassette Memory (p. 76). • CM SEARCH in CAM is set to OFF in the menu settings. → Set it to ON (p. 178). • The tape has a blank portion between recorded portions (p. 77).
Title search does not work.	• The cassette has no Cassette Memory. → Use a cassette with Cassette Memory (p. 75). • CM SEARCH in CAM is set to OFF in the menu settings. → Set it to ON (p. 178). • There is no title in the tape. → Superimpose the titles (p. 97). • The tape has a blank portion between recorded portions (p. 75).
New sound added to the recorded tape is not heard.	• AUDIO MIX in MENU is set to the ST1 side in the menu settings. → Adjust AUDIO MIX (p. 175).
The title is not displayed.	• TITLE DSPL in CAM is set to OFF in the menu settings. → Set it to ON (p. 178).
Noises appear and “PAL” is displayed on the screen.	• The tape was recorded in a TV color system other than that of your camcorder.

(continued on the following page)

When operating using the “Memory Stick”

Symptom	Cause and/or Corrective Actions
Operations on the “Memory Stick” do not function.	• The POWER switch is not set to MEMORY. → Set it to MEMORY (p. 11). • The “Memory Stick” is not inserted. → Insert a “Memory Stick” (p. 104).
Recording does not function.	• The “Memory Stick” has already been recorded to its full capacity. → Delete unnecessary images and record again (p. 138). • The “Memory Stick” formatted incorrectly is inserted. → Format the “Memory Stick” using your camcorder or use another “Memory Stick” (p. 104, 177). • The write-protect tab on the “Memory Stick” is set to LOCK. → Release the lock (p. 102). • You cannot record data in the 100MSDCF folder. It is only for playing back data.
The HOLOGRAM AF light from the HOLOGRAM AF emitter deviates from the center of the image.	• If the HOLOGRAM AF light reaches the subject, the focus is automatically adjusted.
The HOLOGRAM AF light from the HOLOGRAM AF emitter is blurred and adjusting the focus is difficult.	→ Wipe the HOLOGRAM AF emitter with a dry cloth.
The image cannot be deleted.	• The image is protected. → Cancel image protection (p. 137). • The write-protect tab on the “Memory Stick” is set to LOCK. → Release the lock (p. 102). • You are trying to delete more than a hundred image files at once. → You can select up to a hundred image files to delete on the index screen.
You cannot format the “Memory Stick.”	• The write-protect tab on the “Memory Stick” is set to LOCK. → Release the lock (p. 102).
Deleting all the images cannot be carried out.	• The write-protect tab on the “Memory Stick” is set to LOCK. → Release the lock (p. 102).
You cannot protect the image.	• The write-protect tab on the “Memory Stick” is set to LOCK. → Release the lock (p. 102). • The index screen does not appear. → Press INDEX to display the index screen, then protect the image (p. 137).

(continued on the following page)

Symptom	Cause and/or Corrective Actions
You cannot write a print mark on the still image.	• The write-protect tab on the “Memory Stick” is set to LOCK. ➔ Release the lock (p. 102). • The index screen does not appear. ➔ Press INDEX to display the index screen, then write a print mark (p. 142). • You are trying to write a print mark on a moving picture. ➔ Print marks cannot be written on a moving picture (p. 142). • A print mark is written on 999 files. ➔ A print mark can only be written on up to 999 files.
You cannot resize the image file.	• The image files recorded on other equipment may not be resized.
You cannot play back images in actual size.	• You may not be able to play back images in actual size when you try to play back images recorded by other equipment. This is not a malfunction.
You cannot play back image data.	• Your camcorder may not be able to playback the following image files: – Image files in the folder with its name modified with the computer – Image files with their names modified with the computer – Image files processed with the computer • If you record images with any other equipment, the images may not be played back normally on your camcorder.

Others

Symptom	Cause and/or Corrective Actions
A title is not recorded.	• The cassette has no Cassette Memory. → Use a cassette with Cassette Memory (p. 97). • The Cassette Memory is full. → Erase unnecessary titles (p. 98). • The cassette is set to prevent accidental erasure. → Slide the write-protect tab to REC ⟶ (p. 195). • The tape has a blank portion between recorded portions. → Superimpose the title to the recorded position (p. 97).
The title cannot be deleted.	• The cassette is set to prevent accidental erasure. → Slide the write-protect tab to REC ⟶ (p. 195).
A cassette label is not recorded.	• The cassette has no Cassette Memory. → Use a cassette with Cassette Memory (p. 100). • The Cassette Memory is full. → Erase unwanted data (p. 100). • The tape is set to prevent accidental erasure. → Slide the write-protect tab to REC ⟶ (p. 195).
Digital program editing on the tape does not function.	• The input selector on the VCR is not set correctly. → Set the selector correctly, then check the connection between the VCR and your camcorder (p. 81). • Your camcorder is connected to the DV equipment of other than Sony using the i.LINK cable. → Set it to IR (p. 81). • Setting a program on a blank portion of the tape is attempted. → Set the program again on a recorded portion (p. 87). • The synchronization of your camcorder and the VCR is not adjusted. → Adjust the synchronization of the VCR (p. 84). • The IR SETUP code is not correct. → Set the correct code (p. 83).
Digital program editing on the "Memory Stick" does not function.	• Setting a program on a blank portion of the tape is attempted. → Set the program again on a recorded portion (p. 127).
The Remote Commander supplied with your camcorder does not work.	• COMMANDER in ETC is set to OFF in the menu settings. → Set it to ON (p. 181). • Something is blocking the infrared rays. → Remove the obstacle. • The batteries are inserted in the battery holder with the + – polarities incorrectly matching the + – marks. → Insert the batteries with the correct polarity (p. 216). • The batteries are dead. → Insert new ones (p. 216).
The picture from a TV or VCR does not appear even when your camcorder is connected to the outputs on the TV or VCR.	• DISPLAY is set to V-OUT/LCD in ETC in the menu settings. → Set it to LCD (p. 181).

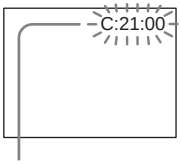
(continued on the following page)

Symptom	Cause and/or Corrective Actions
The melody or beep sounds for five seconds.	• Moisture condensation has occurred. → Remove the cassette and leave your camcorder for at least one hour to acclimatize (p. 202). • Some troubles have occurred in your camcorder. → Remove the cassette and insert it again, then operate your camcorder.
No function works though the power is on.	→ Disconnect the AC Adaptor from a wall outlet or remove the battery pack, then reconnect it in about one minute. Turn the power on. If the functions still do not work, press the RESET button using a sharp-pointed object. (If you press the RESET button, all the settings (DCR-TRV70: except the network settings) including the date and time return to the default) (p. 15, 16, 211).
When you set the POWER switch to VCR or OFF (CHG), if you move your camcorder, you may hear a clattering sound from inside your camcorder.	• This is because some functions use a linear mechanism. This is not a malfunction.
While charging the battery pack, the CHARGE (charge) lamp is not lit.	• Charging the battery pack is completed. • The battery pack is not properly installed. → Install it properly (p. 15).
You cannot charge the battery pack.	• The POWER switch is not set to OFF (CHG). → Set it to OFF (CHG) (p. 16).
The power runs out quickly, even though the remaining battery time indicator is full.	→ Charge the battery pack fully again (p. 16).
While charging the battery pack, the CHARGE (charge) lamp flashes.	• The battery pack is not properly installed. → Install it properly (p. 15). • Something is wrong with the battery pack. → If the symptom persists, disconnect the plug from the wall outlet as soon as possible to cut off the power, and contact your Sony dealer or local authorized Sony service facility.
The buttons do not appear on the touch panel.	• DISPLAY/BATT INFO is pressed. → Press the LCD screen lightly. → Press DISPLAY/BATT INFO on your camcorder or DISPLAY on the Remote Commander (p. 40).
The buttons on the LCD screen do not work.	→ Adjust the screen (CALIBRATION) (p. 204).
Image data cannot be transferred to your computer via the USB connection.	• The USB cable was connected before installation of the USB driver was complete. → Uninstall the USB driver and reinstall the USB driver (p. 148, 153). • USB STREAM in [menu] is set to OFF in the menu settings. → Set it to ON (p. 180).
The cassette cannot be ejected even if the cassette lid is open.	• Your camcorder is on the point of falling into moisture condensation (p. 202).
The cassette cannot be ejected.	→ Remove the battery pack, then install it again (p. 15).

Self-diagnosis display

Your camcorder has a self-diagnosis display function.
This function displays the current state of your camcorder as a 5-digit code (a combination of a letter and figures) on the LCD screen or in the viewfinder. If a 5-digit code appears, check the following list of codes. The last two digits (indicated by ☐☐) differ depending on the state of your camcorder.

LCD screen or viewfinder



Self-diagnosis display
- C:☐☐:☐☐
 You can service your camcorder yourself.
- E:☐☐:☐☐
 Contact your Sony dealer or local authorized Sony service facility.

5-digit display	Cause and/or Corrective Actions
C:04:☐☐	• You are using a battery pack that is not an "InfoLITHIUM" battery pack. ➔ Use an "InfoLITHIUM" battery pack (p. 197).
C:21:☐☐	• Moisture condensation has occurred. ➔ Eject the cassette and leave your camcorder for at least one hour to acclimatize (p. 202).
C:22:☐☐	• The video heads are dirty. ➔ Clean the heads using the cleaning cassette (optional) (p. 203).
C:31:☐☐ C:32:☐☐	• A malfunction other than the above that you can service has occurred. ➔ Eject the cassette and insert it again, then operate your camcorder. Do not perform this operation if moisture starts to condense (p. 202). ➔ Disconnect the power cord of the AC Adaptor or remove the battery pack. After reconnecting the power source, operate your camcorder. ➔ Replace the cassette.
E:20:☐☐ E:61:☐☐ E:62:☐☐ E:91:☐☐	• A malfunction that you cannot service has occurred. ➔ Contact your Sony dealer or local authorized Sony service facility and inform them of the 5-digit code. (e.g. E:61:10)

If you are unable to rectify the problem even if you try corrective actions a few times, contact your Sony dealer or local authorized Sony service facility.

Warning indicators

If indicators appear on the screen, check the following:
See the page in parentheses "()" for details.

101-0001 **Warning indicator pertaining to files**

Slow flashing:
- The file is corrupted.
- The file is unreadable.
- You are trying to carry out MEMORY MIX on a moving picture (p. 118).

C:21:00 **Self-diagnosis display** (p. 191)

The battery pack is dead or nearly dead

Slow flashing:
- The battery pack is nearly dead. Depending on the operating conditions, environmental or battery conditions, the indicator may flash, even if there are approximately five to 10 minutes remaining.

Moisture condensation has occurred *

Fast flashing:
- Eject the cassette, set the POWER switch to OFF (CHG), and leave it for about one hour with the cassette lid open (p. 202).

Warning indicator pertaining to Cassette Memory *

Slow flashing:
- No cassette with Cassette Memory is inserted (p. 194).

Warning indicator pertaining to the "Memory Stick"

Slow flashing:
- No "Memory Stick" is inserted.

Fast flashing:
- The image cannot be recorded on the "Memory Stick."*

Warning indicator pertaining to the "Memory Stick" formatting*

Fast flashing:
- The "Memory Stick" data is corrupted (p. 102).
- The "Memory Stick" is not formatted correctly (p. 177).

Warning indicator pertaining to incompatible "Memory Stick"*

Slow flashing:
- An incompatible "Memory Stick" is inserted.

Warning indicator pertaining to the tape

Slow flashing:
- The tape is near the end.
- No cassette is inserted.*
- The write-protect tab of the cassette is set to SAVE (p. 195).*

Fast flashing:
- The tape has run out.*

You need to eject the cassette*

Slow flashing:
- The write-protect tab on the cassette is set to SAVE (p. 195).

Fast flashing:
- Moisture condensation has occurred (p. 202).
- The tape has run out.
- The self-diagnosis display code is displayed (p. 191).

The image is protected*

Slow flashing:
- The image is protected (p. 137).

Warning indicator pertaining to the flash

Slow flashing:
- During charging

Fast flashing:
- The self-diagnosis display code is displayed (p. 191).*
- There is something wrong with the built-in flash or the external flash (optional).

Warning indicator pertaining to still image recording

Slow flashing:
- The still image cannot be recorded on the "Memory Stick" in the current operating conditions (p. 47).

* You hear the melody or beep sound.

Warning messages

If messages appear on the screen, check the following. See the page in parentheses "()" for details.

• CLOCK SET	Set the date and time (p. 20).
• FOR "InfoLITHIUM" BATTERY ONLY	Use an "InfoLITHIUM" battery pack (p. 197).
• CLEANING CASSETTE	The video heads are dirty (p. 203). The ⊗ indicator and "CLEANING CASSETTE" message appear one after another on the screen.
• COPY INHIBIT	You tried to record a picture that has a copyright control signal (p. 194). *
• FULL	The Cassette Memory is full. *
• 16BIT	AUDIO MODE is set to 16BIT. You cannot dub new sound (p. 179). *
• REC MODE	REC MODE is set to LP. * You cannot dub new sound (p. 179). You cannot dub new sound on the tape recorded in a TV color system other than that of your camcorder.
• TAPE	There is no recorded portion on the tape. * You cannot dub new sound.
• "i.LINK" CABLE	The i.LINK cable is connected. You cannot dub new sound (p. 93). *
• FULL	The "Memory Stick" is full (p. 112). *
•	The write-protect tab on the "Memory Stick" is set to LOCK (p. 102). *
• NO FILE	No image is recorded or there is no recognizable file on the "Memory Stick". *
• NO MEMORY STICK	No "Memory Stick" is inserted. *
• AUDIO ERROR	You are trying to record an image with sound that cannot be recorded by your camcorder on the "Memory Stick" (p. 125). *
• MEMORY STICK ERROR	The "Memory Stick" data is corrupted (p. 104). *
• FORMAT ERROR	The "Memory Stick" is not recognized (p. 177). * Check the format.
• PLAY ERROR	The image is distorted and cannot be played back. * Reinsert the "Memory Stick."
• REC ERROR	Turn the POWER switch on again. *
• INCOMPATIBLE MEMORY STICK	The "Memory Stick" inserted is not compatible with your camcorder. *
• READ-ONLY MEMORY STICK	A read-only "Memory Stick" is inserted. *
• TAPE END	The tape has reached the end of the tape. *
• NO TAPE	Insert a cassette. *
• DELETING	You press PHOTO on your camcorder while deleting data in the "Memory Stick." *
• FORMATTING	You press PHOTO on your camcorder while formatting the "Memory Stick." *
• FOLDER NO.FULL	You have reached the maximum of folders that can be created.
• USB STREAMING ON GOING	Your camcorder is performing the USB Streaming function.
• NOW CHARGING	Charging the built-in flash or an external flash (optional) does not work correctly. *

* You hear the melody or beep sound.

DCR-TRV70 only

Refer to the Network Function / Application Operating Instructions supplied with your camcorder about warning messages in the network function.

Usable cassettes

Selecting cassette types

You can use the mini DV Mini DV cassette only.* You cannot use any other 8 mm 8, Hi8 Hi8, Digital8 8, VHS VHS, VHSC VHSC, S-VHS S VHS, S-VHSC S VHSC, Betamax β, ED Betamax ED Beta, DV DV or MICRO MV MICRO MV cassette.

* There are two types of mini DV cassettes: with Cassette Memory and without Cassette Memory.
Cassettes with Cassette Memory have the

Audio mode

12-bit mode: The original sound can be recorded in stereo 1, and the new sound in stereo 2 in 32 kHz. The balance between stereo 1 and stereo 2 can be adjusted by selecting AUDIO MIX in the menu settings during playback. Both sounds can be played back.

16-bit mode: A new sound cannot be recorded but the original sound can be recorded in high quality. Moreover, your camcorder can also play back sound recorded in 32 kHz, 44.1 kHz or 48 kHz. When playing back the tape recorded in the 16-bit mode, the 16BIT indicator appears on the screen.

When you play back a dual sound track tape

When you play back a dual sound track tape recorded in a stereo system, set HiFi SOUND in [VTR] to a desired mode in the menu settings (p. 175).

Sound from speaker

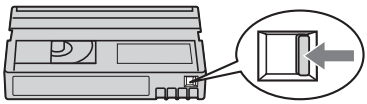
HiFi Sound Mode	Playing back the stereo tape	Playing back the dual sound track tape
STEREO	Stereo	Main sound and sub sound
1	Lch	Main sound
2	Rch	Sub sound

You cannot record dual sound programs on your camcorder.

Notes on the cassette

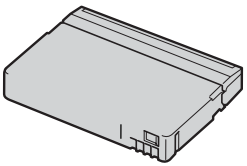
To prevent accidental erasure

Slide the write-protect tab on the cassette to SAVE ←.



When affixing a label on the cassette

Be sure to affix a label only on the locations as illustrated below **[a]** so as not to cause malfunction of your camcorder.



[a]

After using the cassette

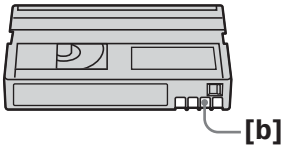
Rewind the tape to the beginning, put the cassette in its case, and store it in an upright position.

When the Cassette Memory function does not work

Reinsert a cassette. The gold-plated connector of mini DV cassettes may be dirty or dusty.

Cleaning the gold-plated connector

If the gold-plated connector on the cassette is dirty or dusty, the remaining tape indicator sometimes does not appear correctly, and you may not be able to operate functions using Cassette Memory.
Clean up the gold-plated connector with a cotton-wool swab, about every 10 times ejection of a cassette. **[b]**



About the “InfoLITHIUM” battery pack

This unit is compatible with the “InfoLITHIUM” battery pack (M series). Your camcorder operates only with the “InfoLITHIUM” battery pack. “InfoLITHIUM” M series battery packs have the InfoLITHIUM M SERIES mark.

What is the “InfoLITHIUM” battery pack?

The “InfoLITHIUM” battery pack is a lithium-ion battery pack that has functions for communicating information related to operating conditions between your camcorder and an optional AC adaptor/charger.
The “InfoLITHIUM” battery pack calculates the power consumption according to the operating conditions of your camcorder, and displays the remaining battery time in minutes. With an AC adaptor/charger (optional), the remaining battery time and charging time appear.

Charging the battery pack

- Be sure to charge the battery pack before you start using your camcorder.
- We recommend charging the battery pack in an ambient temperature of between 10°C to 30°C (50°F to 86°F) until the CHARGE (charge) lamp turns off. If you charge the battery outside of this temperature range, you may not be able to efficiently charge the battery pack.
- After charging is complete, either disconnect the cable from the DC IN jack on your camcorder or remove the battery pack.

Effective use of the battery pack

- Battery pack performance decreases in 10°C (50°F) or below surroundings. So, the time that the battery pack can be used becomes shorter. We recommend the following to ensure longer battery pack use:
 – Put the battery pack in a pocket to warm it up, and insert it in your camcorder immediately before you start taking shots.
 – Use the large capacity battery pack (NP-FM70/QM71/QM71D/FM91/QM91/QM91D, optional).
- Frequently using the LCD screen or frequently operating playback, fast forward or rewind wears out the battery pack faster. We recommend using the large capacity battery pack (NP-FM70/QM71/QM71D/FM91/QM91/QM91D, optional).
- Be sure to set the POWER switch to OFF (CHG) when not taking shots or playing back on your camcorder. The battery pack is also consumed when your camcorder is during tape recording standby or playback pause.
- Have spare battery packs handy for two or three times the expected recording time, and make trial recordings before taking the actual recording.
- Do not expose the battery pack to water. The battery pack is not water resistant.

Remaining battery time indicator

- If the power goes off although the remaining battery time indicator indicates that the battery pack has enough power to operate, charge the battery pack fully again so that the indication on the remaining battery time is correct. Note, however, that the correct battery indication sometimes will not be restored if it is used in high temperatures for a long time or left in a fully charged state, or the battery pack is frequently used. Regard the remaining battery time indication as the approximate shooting time.
- The mark indicating that there is little remaining battery time sometimes flashes depending on the operating conditions or ambient temperature and environment even if the remaining battery time is about five to 10 minutes.

How to store the battery pack

- If the battery pack is not used for a long time, do the following procedure once per year to maintain the proper function.
 1. Fully charge the battery pack.
 2. Use the battery pack up on your camcorder.
 3. Remove the battery pack from your camcorder and store it in a dry, cool place.
- To use the battery pack up on your camcorder, leave your camcorder in tape recording standby until the power goes off without a cassette inserted.

Battery life

- The battery life is limited. Battery capacity drops little by little as you use it more and more, and as time passes. When the available battery time is shortened considerably, a probable cause is that the battery pack has reached the end of its life. Please buy a new battery pack.
- The battery life varies depending on how it is stored and operating conditions and environment for each battery pack.

Disposaling of the battery pack

Certain countries or areas may regulate disposal of the battery pack used to power this product. Please consult with your local authority.

“InfoLITHIUM” is a trademark of Sony Corporation.

About i.LINK

The DV Interface on this unit is an i.LINK-compliant DV Interface. This section describes the i.LINK standard and its features.

What is i.LINK?

i.LINK is a digital serial interface for handling digital video, digital audio and other data in two directions between equipment having the i.LINK, and for controlling other equipment.
i.LINK-compatible equipment can be connected by a single i.LINK cable. Possible applications are operations and data transactions with various digital AV equipment. When two or more i.LINK-compatible equipment are connected to this unit in a daisy chain, operations and data transactions are possible with not only the equipment that this unit is connected to but also with other devices via the directly connected equipment.
Note, however, that the method of operation sometimes varies according to the characteristics and specifications of the equipment to be connected, and that operations and data transactions are sometimes not possible on some connected equipment.

Note

Normally, only one piece of equipment can be connected to this unit by the i.LINK cable. When connecting this unit to i.LINK-compatible equipment having two or more DV Interfaces, refer to the operating instructions of the equipment to be connected.

About the name "i.LINK"

i.LINK is a more familiar term for IEEE 1394 data transport bus proposed by Sony, and is a trademark approved by many corporations.
IEEE 1394 is an international standard standardized by the Institute of Electrical and Electronics Engineers.

i.LINK Baud rate

i.LINK's maximum baud rate varies according to the equipment. Three maximum baud rates are defined:

S100 (approx. 100 Mbps*)
S200 (approx. 200 Mbps)
S400 (approx. 400 Mbps)

The baud rate is listed under "Specifications" in the operating instructions of each equipment. It is also indicated near the i.LINK on some equipment.
The maximum baud rate of equipment on which it is not indicated such as this unit is "S100."
When units are connected to equipment having a different maximum baud rate, the baud rate sometimes differs from the indicated baud rate.

*What is Mbps?

Mbps stands for megabits per second, or the amount of data that can be sent or received in one second. For example, a baud rate of 100 Mbps means that 100 megabits of data can be sent in one second.

i.LINK functions on this unit

For details on how to dub when this unit is connected to other video equipment having DV Interface, see pages 78, 89.
This unit can also be connected to other i.LINK (DV Interface) compatible equipment made by Sony (e.g. VAIO series personal computer) other than video equipment.
Before connecting this unit to your computer, make sure that application software supported by this unit is already installed on your computer.
Beware that some of the video equipment such as the Digital Televisions, the DVD recorders / players or the MICROMV recorders / players are equipped with the i.LINK jack but not comapatible with the DV equipment. Be sure to confirm whether the equipment is compatible with the DV equipment or not before connecting your camcorder to it.
For details on precautions when connecting this unit, also refer to the operating instructions for the equipment to be connected.

Required i.LINK Cable

Use the Sony i.LINK 4-pin-to-4-pin cable (during DV dubbing).

i.LINK and i, are trademarks.

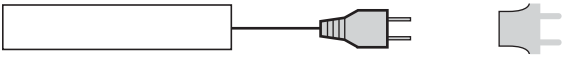
Using your camcorder abroad

Using your camcorder abroad

For details on using the Network function abroad, refer to the operating instructions supplied with the USB device (optional) (DCR-TRV70 only).

You can use your camcorder in any country or area with the AC Adaptor supplied with your camcorder within 100 V to 240 V AC, 50/60 Hz.

Use a commercially available AC plug adaptor **[a]**, if necessary, depending on the design of the wall outlet **[b]**.



Your camcorder is an NTSC system-based camcorder. If you want to view the playback picture on a TV, it must be an NTSC system-based TV with the AUDIO/VIDEO input jack.
The following shows TV color systems used overseas.

NTSC system
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Guyana, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

PAL system
Australia, Austria, Belgium, China, Czech Republic, Denmark, Finland, Germany, Holland, Hong Kong, Hungary, Italy, Kuwait, Malaysia, New Zealand, Norway, Poland, Portugal, Singapore, Slovak Republic, Spain, Sweden, Switzerland, Thailand, United Kingdom, etc.

PAL-M system
Brazil

PAL-N system
Argentina, Paraguay, Uruguay

SECAM system
Bulgaria, France, Guiana, Iran, Iraq, Monaco, Russia, Ukraine, etc.

Moisture condensation

If your camcorder is brought directly from a cold place to a warm place, moisture may condense inside your camcorder, on the surface of the tape, or on the lens. In this state, the tape may stick to the head drum and be damaged or your camcorder may not operate correctly. If there is moisture inside your camcorder, the beep sounds and the indicator flashes. The ⏏ indicator flashes at the same time while the cassette is inserted in your camcorder. If moisture condenses on the lens, the indicator will not appear.

If moisture condensation has occurred

None of the functions except cassette ejection will work. Eject the cassette, turn off your camcorder, and leave it for about one hour with the cassette lid open. Your camcorder can be used again if the or ⏏ indicator does not appear when the power is turned on again.

If moisture starts to condense, your camcorder sometimes cannot detect condensation. If this happens, the cassette is sometimes not ejected for 10 seconds after the cassette lid is opened. This is not a malfunction. Do not close the cassette lid until the cassette is ejected.

Note on moisture condensation

Moisture may condense when you bring your camcorder from a cold place into a warm place (or vice versa) or when you use your camcorder in a hot place as follows:

– You bring your camcorder from a ski slope into a place warmed up by a heating device.
– You bring your camcorder from an air-conditioned car or room into a hot place outside.
– You use your camcorder after a squall or a shower.
– You use your camcorder in a high temperature and humidity place.

How to prevent moisture condensation

When you bring your camcorder from a cold place into a warm place, put your camcorder in a plastic bag and tightly seal it. Remove the bag when the air temperature inside the plastic bag has reached the surrounding temperature (after about one hour).

Maintenance information

Cleaning the video head

To ensure normal recording and clear pictures, clean the video head. The video head may be dirty when:

– Mosaic-pattern noise appears on the playback picture.
– Playback pictures do not move.
– Playback pictures do not appear or the sound breaks off.
– The ⊗ indicator and "CLEANING CASSETTE" message appear one after another or the ⊗ indicator flashes on the screen during recording.

If the above problem, **[a]**, **[b]** or **[c]** occurs, clean the video heads for 10 seconds with the Sony DVM-12CLD cleaning cassette (optional). Check the picture and if the above problem persists, repeat cleaning.

[a]



[b]



[c]



If the video heads get dirtier, the entire screen becomes blue **[c]**.

Note on the video head

The video head suffers from wear after long use. If you cannot obtain a clear image even after using a cleaning cassette, it might be because the video head is worn. Please contact your Sony dealer or local authorized Sony service facility to have the video head replaced.

Cleaning the LCD screen

If fingerprints or dust make the LCD screen dirty, we recommend using the cleaning cloth (supplied) to clean the LCD screen. When you use the LCD Cleaning Kit (optional), do not apply the cleaning liquid directly to the LCD screen. Clean the LCD screen with cleaning paper moistened with the liquid.

Charging the built-in rechargeable battery

Your camcorder has a built-in rechargeable battery so that the date, time and other settings are retained even when the POWER switch is set to OFF (CHG). The built-in rechargeable battery is always charged as long as you are using your camcorder. The battery, however, will get discharged gradually if you do not use your camcorder. It will be completely discharged in **about three months** if you do not use your camcorder at all. Even if the built-in rechargeable battery is not charged, it will not affect your camcorder operation. To retain the date and time, etc., charge the battery if the battery is discharged.

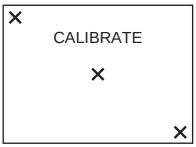
Charging the built-in rechargeable battery

- Connect your camcorder to the house current using the AC Adaptor supplied with your camcorder, and leave your camcorder with the POWER switch set to OFF (CHG) for more than 24 hours.
- Or install the fully charged rechargeable battery pack on your camcorder, and leave your camcorder with the POWER switch set to OFF (CHG) for more than 24 hours.

Adjusting the LCD screen (CALIBRATION)

The buttons on the touch panel may not work correctly. If this happens, follow the procedure below.
We recommend connecting your camcorder to the house current using the AC Adaptor supplied with your camcorder during the operation.

(1) Set the POWER switch to OFF (CHG).
(2) Eject the tape from your camcorder, then disconnect any connecting cable from your camcorder.
(3) Set the POWER switch to VCR while pressing DISPLAY/BATT INFO on your camcorder, then keep pressing DISPLAY/BATT INFO for about five seconds.
(4) Touch ✕ displayed on the screen with your finger or the supplied stylus (DCR-TRV70 only).
The position of ✕ changes.



Notes

- If you do not press the right spot, start from Step 4 again.
- You cannot calibrate the LCD screen when you rotate the LCD panel and set the LCD screen facing out.

Precautions

Camcorder operation

- Operate your camcorder on 7.2 V (battery pack) or 8.4 V (AC Adaptor).
- For DC or AC operation, use the accessories recommended in these operating instructions.
- If any solid object or liquid get inside the casing, unplug your camcorder and have it checked by a Sony dealer before operating it any further.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the POWER switch set to OFF (CHG) when you are not using your camcorder.
- Do not wrap your camcorder with a towel, for example, and operate it. Doing so might cause heat to build up inside.
- Keep your camcorder away from strong magnetic fields or mechanical vibration.
- Do not press the LCD screen with sharp-pointed objects other than the supplied stylus. (DCR-TRV70 only)
- If your camcorder is used in a cold place, a residual image may appear on the LCD screen. This is not a malfunction.
- While using your camcorder, the back of the LCD screen may heat up. This is not a malfunction.

On handling the tape

- Do not insert anything into the small holes on the rear of the cassette. These holes are used to sense the type and thickness of the tape and if the recording tab is in or out.
- Do not open the tape protect cover or touch the tape.
- Avoid touching or damaging the terminals. To remove dust, clean the terminals with a soft cloth.

Camcorder care

- Eject the cassette, and periodically turn on the power, operate the CAMERA and VCR sections and play back a tape for about three minutes when your camcorder is not to be used for a long time.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on the lens, remove them with a soft cloth.
- Clean your camcorder body with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.
- Do not let sand get into your camcorder. When you use your camcorder on a sandy beach or in a dusty place, protect it from the sand or dust. Sand or dust may cause your camcorder to malfunction, and sometimes this malfunction cannot be repaired.

AC Adaptor

- Unplug the unit from a wall outlet when you are not using the unit for a long time. To disconnect the power cord, pull it out by the plug. Never pull the power cord itself.
- Do not operate the unit with a damaged cord or if the unit has been dropped or damaged.
- Do not bend the power cord forcibly, or place a heavy object on it. This will damage the cord and may cause fire or electrical shock.
- Prevent metallic objects from coming into contact with the metal parts of the connecting section. If this happens, a short may occur and the unit may be damaged.
- Always keep metal contacts clean.
- Do not disassemble the unit.
- Do not apply mechanical shock or drop the unit.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment. AM receivers and video equipment disturb AM reception and video operation.
- The unit becomes warm during use. This is not a malfunction.
- Do not place the unit in locations that are:
 - Extremely hot or cold
 - Dusty or dirty
 - Very humid
 - Vibrating

About care and storage of the lens

- Wipe the surface of the lens clean with a soft cloth in the following instances:
 - When there are fingerprints on the lens surface.
 - In hot or humid locations
 - When the lens is used in environments such as the seaside.
- Store the lens in a well-ventilated location subject to little dirt or dust.

To prevent mold from occurring, periodically perform the above.
We recommend turning on and operating your camcorder about once per month to keep your camcorder in an optimum state for a long time.

Rechargeable battery pack

- Use only the specified charger or video equipment with the charging function.
- To prevent an accident from a short circuit, do not allow metal objects to come into contact with the battery terminals.
- Keep the rechargeable battery pack away from fire.
- Never expose the rechargeable battery pack to temperatures above 60°C (140°F), such as in a car parked in the sun or under direct sunlight.
- Store the rechargeable battery pack in a cool, dry place.
- Do not expose the rechargeable battery pack to any mechanical shock.
- Do not disassemble nor modify the rechargeable battery pack.
- Install the rechargeable battery pack to the video equipment securely.
- Charging while some capacity remains does not affect the original battery capacity.

Note on dry batteries

To avoid possible damage from battery leakage or corrosion, observe the following:

– Be sure to insert the batteries with the + – polarities matched to the + – marks in the battery compartment.
– Dry batteries are not rechargeable.
– Do not use a combination of new and old batteries.
– Do not use different types of batteries.
– Current flows from batteries when you are not using them for a long time.
– Do not use leaking batteries.

If batteries are leaking

• Wipe off the liquid in the battery compartment carefully before replacing the batteries.
• If you touch the liquid, wash it off with water.
• If the liquid get into your eyes, wash your eyes with a lot of water and then consult a doctor.

If any problem occurs, unplug your camcorder and contact your nearest Sony dealer.

Specifications

Video camera recorder

System

Video recording system
2 rotary heads
Helical scanning system
Audio recording system
Rotary heads, PCM system
Quantization: 12 bits (Fs 32 kHz, stereo 1, stereo 2), 16 bits (Fs 48 kHz, stereo)
Video signal
NTSC color, EIA standards
Usable cassette
Mini DV cassette with the Mini DV mark printed
Tape speed
SP: Approx. 18.81 mm/s
LP: Approx. 12.56 mm/s
Recording/playback time (using cassette DVM60)
SP: 1 hour
LP: 1.5 hours
Fastforward/rewind time (using cassette DVM60)
Approx. 2 min. and 40 seconds
Viewfinder
Electric viewfinder (color)
Image device
5.0 mm (1/3.6 type) CCD (Charge Coupled Device)
Gross: Approx. 2 110 000 pixels
Effective (still):
Approx. 1 920 000 pixels
Effective (moving):
Approx. 1 080 000 pixels
Lens
Carl Zeiss Vario-Sonnar T*
Combined power zoom lens
Filter diameter: 37 mm (1 1/2 in.)
10× (Optical), 120× (Digital)
F = 1.8 ~ 2.1
Focal length
4.5 – 45 mm (3/16 – 1 13/16 in.)
When converted to a 35 mm still camera
In CAMERA:
52 – 520 mm (2 1/8 – 20 1/2 in.)
In MEMORY:
39 – 390 mm (1 9/16 – 15 3/8 in.)
Color temperature
Auto, HOLD, INDOOR (3 200 K), OUTDOOR (5 800 K)
Minimum illumination
7 lx (lux) (F 1.8)
0 lx (lux) (in the NightShot mode)*
* Objects unable to be seen due to the dark can be shot with infrared lighting.

Input/Output connectors

S video input/output
4-pin mini DIN
Luminance signal: 1 Vp-p, 75 Ω (ohms), unbalanced
Chrominance signal: 0.286 Vp-p, 75 Ω (ohms), unbalanced
Audio/Video input/output
AV MINI JACK, 1 Vp-p, 75 Ω (ohms), unbalanced
327 mV, (at output impedance more than 47 kΩ (kilohms))
Output impedance with less than 2.2 kΩ (kilohms)/Stereo minijack (ø 3.5 mm)
Input impedance more than 47 kΩ (kilohms)
DV input/output
4-pin connector
Headphone jack
Stereo minijack (ø 3.5 mm)
LANC jack
Stereo mini-minijack (ø 2.5 mm)
USB jack
DCR-TRV60:
mini-B
DCR-TRV70:
mini-AB
MIC jack
Minijack, 0.388 mV low impedance with 2.5 to 3.0 V DC, output impedance 6.8 kΩ (kilohms) (ø 3.5 mm)
Stereo type

LCD screen

Picture
6.2 cm (2.5 type)
Total dot number
211 200 (960 × 220)

General

Power requirements
7.2 V (battery pack)
8.4 V (AC Adaptor)
Average power consumption (when using the battery pack)
During camera recording using LCD
4.6 W
Viewfinder
3.9 W
Operating temperature
0°C to 40°C (32°F to 104°F)
Storage temperature
–20°C to + 60°C (–4°F to + 140°F)
Dimensions (approx.)
73 × 90 × 174 mm (2 7/8 × 3 5/8 × 6 7/8 in.) (w/h/d)
Mass (Approx.)
640 g (1 lb 6 oz) main unit only
740 g (1 lb 10 oz) including the rechargeable battery pack NP-FM50, cassette DVM60 and lens cap
Supplied accessories
See page 14.

AC Adaptor AC-L15A/L15B

Power requirements
100 – 240 V AC, 50 / 60 Hz
Current consumption
0.35 – 0.18 A
Power consumption
18 W
Output voltage
DC OUT: 8.4 V, 1.5 A
Operating temperature
0°C to 40°C (32°F to 104°F)
Storage temperature
–20°C to + 60°C
(–4°F to + 140°F)
Dimensions (approx.)
56 × 31 × 100 mm
(2 1/4 × 1 1/4 × 4 in.) (w / h / d)
excluding projecting parts
Mass (approx.)
190 g (6.7 oz)
excluding power cord

Rechargeable battery pack NP-FM50

Maximum output voltage
DC 8.4 V
Output voltage
DC 7.2 V
Capacity
8.5 Wh (1 180 mAh)
Dimensions (approx.)
38.2 × 20.5 × 55.6 mm
(1 9/16 × 13/16 × 2 1/4 in.)
(w / h / d)
Mass (approx.)
76 g (2.7 oz)
Type
Lithium ion

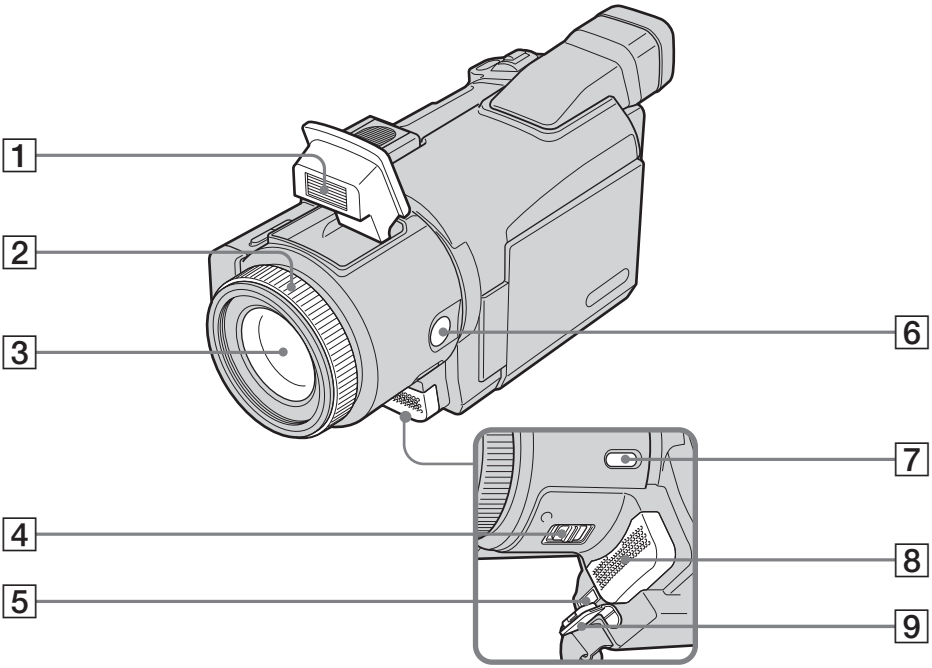
"Memory Stick"

Memory
Flash memory
8 MB: MSA-8A
Operating voltage
2.7 – 3.6 V
Power consumption
Approx. 45 mA during operation mode
Approx. 130 µA during tape recording standby
Dimensions (approx.)
50 × 2.8 × 21.5 mm
(2 × 1/8 × 7/8 in.) (w / h / d)
Mass (approx.)
4 g (0.14 oz)

Design and specifications are subject to change without notice.

Identifying parts and controls

Camcorder



1 **Flash** (p. 113)

2 **Focus ring** (p. 63)

3 **Lens**

4 **NIGHTSHOT switch** (p. 34)

5 **DC IN jack** (p. 8, 16)

6 **FOCUS button** (p. 63)

7 **BACK LIGHT button** (p. 34)

8 **Microphone**

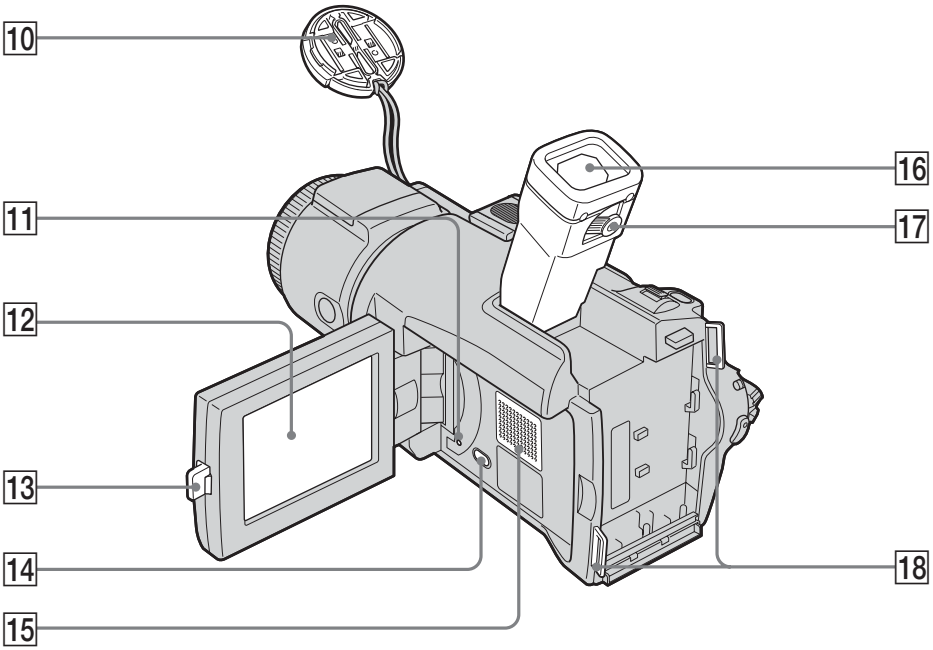
9 **DC IN jack cover**

Note on the Carl Zeiss lens

Your camcorder is equipped with a Carl Zeiss lens which can reproduce fine images. The lens for your camcorder was developed jointly by Carl Zeiss, in Germany, and Sony Corporation. It adopts the MTF# measurement system for video camera and offers a quality as the Carl Zeiss lens.

The lens for your camcorder is also T*-coated to suppress unwanted reflection and faithfully reproduce colors.

MTF stands for Modulation Transfer Function.
The value number indicates the amount of light of a subject coming into the lens.



10 **Lens cap** (p. 25)

11 **RESET button**
If you press RESET, all the settings (DCR-TRV70: except the network settings) including the date and time return to the default.

12 **LCD/Touch panel screen** (p. 23)

13 **OPEN button** (p. 25)

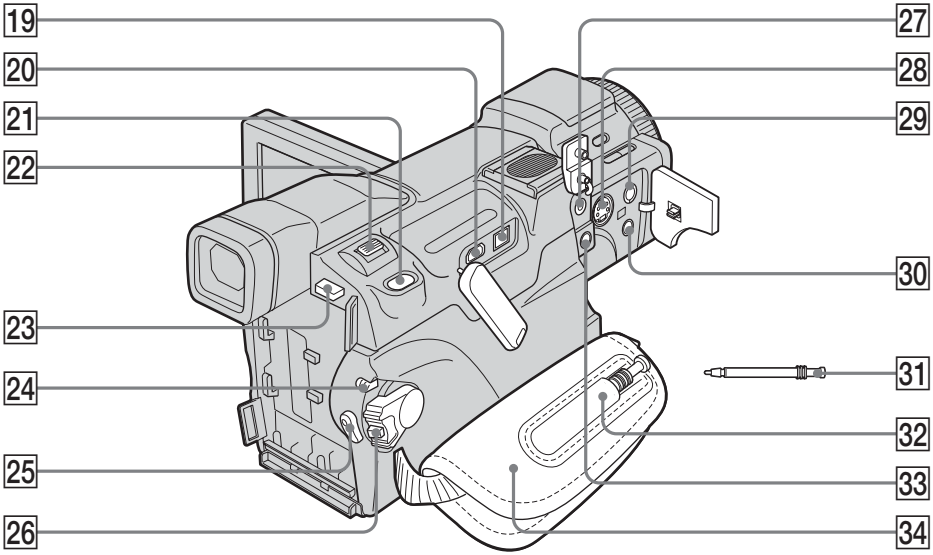
14 **DISPLAY/BATT INFO button** (p. 18, 40)

15 **Speaker**

16 **Viewfinder** (p. 31)

17 **Viewfinder lens adjustment lever** (p. 31)

18 **Hooks for shoulder strap**



19 **DV Interface** (p. 78, 89, 144, 169, 199)
The DV Interface is i.LINK compatible.

20 **(USB) jack** (p. 143)

21 **PHOTO button** (p. 46, 109, 116)

22 **Power zoom lever** (p. 33, 73, 135)

23 **BATT release button** (p. 15)

24 **LOCK switch** (p. 26)

25 **START/STOP button** (p. 25)

26 **POWER switch** (p. 25)

27 **(LANC) jack (blue)**

28 **S VIDEO jack** (p. 45, 79, 90, 170)

29 **AUDIO/VIDEO jack (yellow)** (p. 44, 78, 89, 169)

30 **(headphones) jack (green)**
When you use headphones, the speaker on your camcorder is silent.

31 **Stylus** (DCR-TRV70 only) (p. 171)

32 **Stylus holder** (DCR-TRV70 only)

33 **MIC (PLUG IN POWER) jack (red)** (p. 93)
Connect an external microphone (optional). This jack also accepts a "plug-in-power" microphone.
When an external microphone is connected, it is preferred for an audio input source.

34 **Grip belt** (p. 8)

LANC
The LANC stands for Local Application Control Bus System. The LANC control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the jack indicated as CONTROL L or REMOTE.

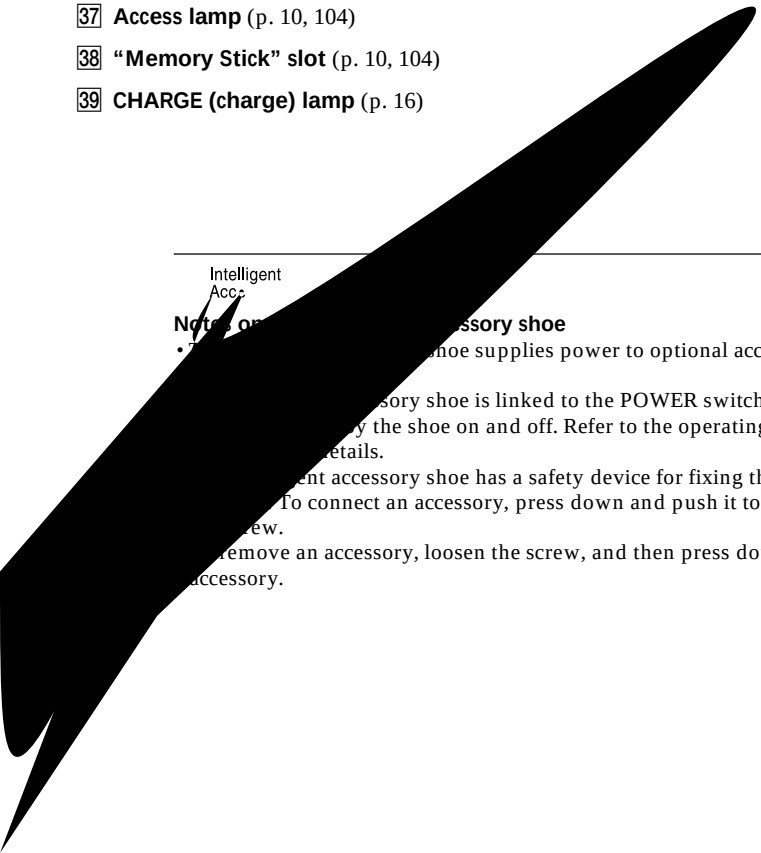
35 **Intelligent accessory shoe** (p. 94)

36 **Shoe cover** (p. 94)

37 **Access lamp** (p. 10, 104)

38 **"Memory Stick" slot** (p. 10, 104)

39 **CHARGE (charge) lamp** (p. 16)



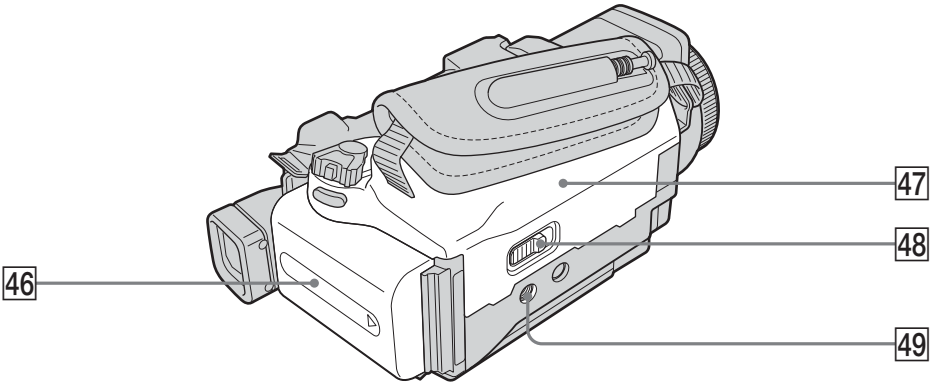
Notes on ssory shoe

• hoe supplies power to optional accessories such as a video

ssory shoe is linked to the POWER switch, allowing you to turn the y the shoe on and off. Refer to the operating instructions of the etails.

nt accessory shoe has a safety device for fixing the installed accessory To connect an accessory, press down and push it to the end, and then tighten ew.

emove an accessory, loosen the screw, and then press down and pull out the ccessory.



46 **Battery pack** (p. 15, 16)

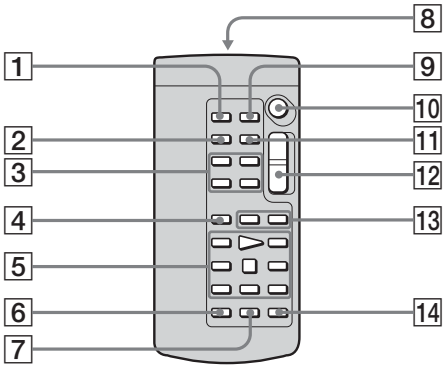
47 **Cassette compartment** (p. 8)

48 **OPEN/⏏ EJECT lever** (p. 8)

49 **Tripod receptacle**
Make sure that the length of the tripod screw is less than 5.5 mm (7/32 inch). Otherwise, you cannot attach the tripod securely, and the screw may damage your camcorder.

Remote Commander

The buttons that have the same name on the Remote Commander as on your camcorder function identically to the buttons on your camcorder.



1 **PHOTO button** (p. 46, 110, 116)

2 **DISPLAY button** (p. 40)

3 **Memory control buttons**

4 **SEARCH MODE button** (p. 75, 76)

5 **Video control buttons** (p. 43)

6 **REC button** (p. 90)

7 **MARK button** (p. 86)

8 **Transmitter**
Point toward the remote sensor to control your camcorder after turning on your camcorder.

9 **ZERO SET MEMORY button** (p. 74)

10 **START/STOP button** (p. 25)

11 **DATA CODE button** (p. 40)

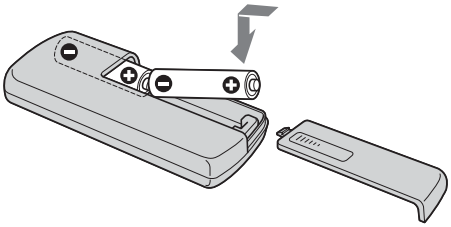
12 **Power zoom button** (p. 33)

13 **I◄◄ /►►I buttons** (p. 75, 76)

14 **AUDIO DUB button** (p. 95)

To prepare the Remote Commander

Insert two size AA (R6) batteries by matching the + and – on the batteries to the + and – in the battery compartment.

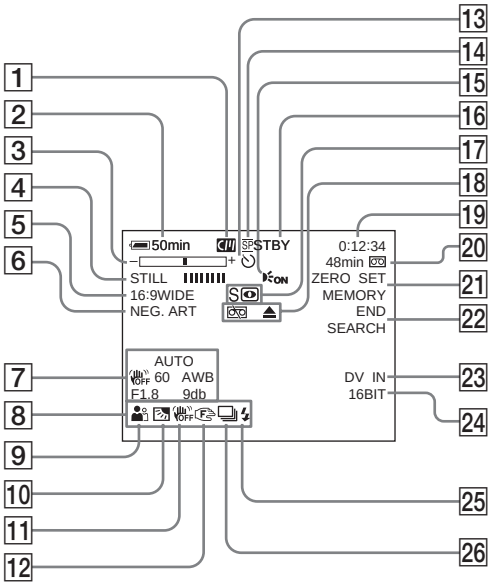


Notes on the Remote Commander

- Point the remote sensor away from strong light sources such as direct sunlight or overhead lighting. Otherwise, the Remote Commander may not function properly.
- Attaching the lens hood (supplied) or a conversion lens (optional) may obstruct the remote sensor, and in this situation, the remote commander may not work correctly.
- Your camcorder works in the commander mode VTR 2. Commander modes 1, 2 and 3 are used to distinguish your camcorder from other Sony VCRs to avoid erroneous remote control operation. If you use another Sony VCR in the commander mode VTR 2, we recommend changing the Commander mode or covering the sensor of the VCR with black paper.

Operation indicators

LCD screen and Viewfinder



1 **Cassette Memory** (p. 12, 194)

2 **Remaining battery time** (p. 27)

3 **Zoom** (p. 33)**/Exposure** (p. 61)**/ Data file name** (p. 102)

4 **Digital effect** (p. 56, 72)**/MEMORY MIX** (p. 118)**/Fader** (p. 52)

5 **16:9WIDE** (p. 50)

6 **Picture effect** (p. 55, 71)

7 **Data code** (p. 40)

8 **Volume** (p. 39)**/Date** (p. 27)**/ Time** (p. 27)

9 **PROGRAM AE** (p. 59)

10 **Back light** (p. 34)

11 **SteadyShot off** (p. 174)

12 **Manual focus/Expanded focus** (p. 63)

13 **Self-timer** (p. 48, 124)

14 **Recording mode** (p. 27)

15 **HOLOGRAM AF** (p. 115)

16 **STBY/REC** (p. 27)**/Video control mode** (p. 43)**/Image size** (p. 106, 107)**/ Image quality** (p. 105)

17 **NIGHTSHOT** (p. 34)**/SUPER NIGHTSHOT** (p. 35)**/COLOR SLOW SHUTTER** (p. 35)

18 **Warning** (p. 192)

19 **Time code** (p. 27)**/Tape counter** (p. 27)**/Self-diagnosis** (p. 191)**/Photo recording** (p. 109)**/Image number** (p. 130)**/Playback folder** (p. 134)

20 **Remaining tape** (p. 27)**/Memory playback** (p. 130)

21 **ZERO SET MEMORY** (p. 74)

22 **END SEARCH** (p. 37)

23 **A/V → DV** (p. 169)**/DV IN** (p. 90)

24 **Audio mode** (p. 179)**/Recording folder** (p. 129)

25 **Flash** (p. 113)
This indicator appears only when the flash is in use.

26 **Continuous photo recording** (p. 111)

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AUDIO MODE 179
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Printed in Japan

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